Course guide
220143 - 220143 - Uav Hardware & Programming

Last modified: 19/04/2023

Unit in charge:	Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit:	710 - EEL - Department of Electronic Engineering.

Degree:	BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
	BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023   **ECTS Credits:** 3.0   **Languages:** English

LECTURER

Coordinating lecturer: David Gonzalez

Others:

TEACHING METHODOLOGY

This is a course "hands-on" oriented. This means that all subject will be delivered in the lab with hardware availability. However, the course will also content some lectures focused in some theoretical issues. Students will be asked to develop some tasks that synthetize several concepts and knowledge acquired in previous or current courses.

LEARNING OBJECTIVES OF THE SUBJECT

The goal of this subject is to deliver basic knowledge about electric propulsion, control hardware and programming of GNC tasks. At the end of this subject, student should be able to program GNC algorithms in a given hardware by they own.

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	40.00
Self study	45,0	60.00

Total learning time: 75 h

CONTENTS

Module 1: General description of UAV architecture

Description:
- Description of a UAV architecture from the control hardware point of view.

Full-or-part-time: 7h 30m
Theory classes: 3h
Self study : 4h 30m

Module 2: Control hardware functionality

Description:
- The functionality and capabilities of the experimental platform used in this course will be described. This platform is the MultiWii Pirate control board (Arduino compatible)

Full-or-part-time: 7h 30m
Theory classes: 3h
Self study : 4h 30m

Module 3: Basics of electric propulsion

Description:
- Basic concepts of electric propulsion will be delivered. It will be covered concepts as: power converters (inverters), batteries behavior and modeling, and basics of electric motors

Full-or-part-time: 15h
Theory classes: 6h
Self study : 9h

Module 4: Implementation of GNC algorythms

Description:

Full-or-part-time: 30h
Theory classes: 12h
Self study : 18h

Module 5: Basics of data storage and data transmission

Description:

Full-or-part-time: 15h
Theory classes: 6h
Self study : 9h

GRADING SYSTEM

The grade of the subject is based on 4 individual reports delivered individually by students. Students will be asked to perform a speech presentation of the final report.

Subject_Grade=(0.25*Report_1+0.25*Report_2+0.25* Report_3+0.25* Report_4)
Any student who wishes to improve his grade may try it at the exam planned at the end of the course. The best note is preserved