

Course guide

220142 - UAVID - Uav Research & Development

Last modified: 15/07/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 732 - OE - Department of Management.

Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2025 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer: Lordan Gonzalez, Oriol

Others:

TEACHING METHODOLOGY

The course is divided into four parts:

- *Theory sessions
- *Activity sessions
- *Project sessions
- *Self-study

In the theory sessions (in the classroom), lecturers will introduce the theoretical basis of the concepts and methods behind UAVs and illustrate them with examples appropriate to facilitate their understanding.

In the activity sessions (in the classroom), lecturers will guide students in applying theoretical concepts to program mini-drones.

In the project sessions (in the classroom), students will apply the theoretical concepts to the project.

The course is hands on orientated through the activity and project sessions.

Students, independently, will need to work on the materials provided by lecturers in order to develop the project. The lecturers provide the syllabus and monitoring of activities (by ATENEA).

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of the course is to understand how individual or multiple drones can be programmed to perform a flight.

STUDY LOAD

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

Total learning time: 75 h

CONTENTS

Module 1: Programming a single drone

Description:

Learn how to program a single mini-drone

Related activities:

Assignment 1: 1-digit numbers (with and without pads)

Full-or-part-time: 25h

Theory classes: 15h

Self study : 10h

Module 2: Programming multiple drones

Description:

Learn how to program multiple mini-drones

Related activities:

Assignment 2: 3 drones in sync

Assignment 3: Rotating square with several drones

Full-or-part-time: 20h

Theory classes: 10h

Self study : 10h

Module 3: Advanced programming

Description:

Learn how to create advanced figures

Related activities:

Assignment 4: Rubik's cube with several drones

Assignment 5: Magic shuriken with several drones

Project: Imitate a real moving thing with more than 20 drones

Full-or-part-time: 30h

Theory classes: 5h

Self study : 25h

GRADING SYSTEM

The final grade depends on the following assessment criteria:

Assignment 1: 20%

Assignment 2: 25%

Assignment 3: 20%

Assignment 4: 10%

Assignment 5: 10%

Project: 15 %

As there are no written tests, there won't be any exam to retake.



RESOURCES

Hyperlink:

- Direct Python. <https://github.com/dwalker-uk/TelloEduSwarmSearch-Swarm-SDK>.
<https://github.com/TelloSDK/Multi-Tello-Formation>

Other resources:

Notes, exercise lists and videos available at Atenea.