220142 - Uav Research & Development

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2017
Degree:
- BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
- BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: English

Coordinator: Oriol Lordan

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 develop R&D UAV projects based on quadcopters. In the project sessions (in the classroom), students will apply the theoretical concepts in a specific project with UAVs. Students, independently, will need to work on the materials provided by lecturers in order to fix and assimilate the concepts, as well as to develop the project. The lecturers provide the syllabus and monitoring of activities (by ATENEA).

The course is develops through lectures including theoretical sessions imparted with the aid of powerpoint presentations and more applicative and more visual sessions with videos, stellar catalogues and simulations.

Learning objectives of the subject

In this course students will develop projects using or improving unmanned aircraft vehicles. These projects integrate knowledge of multiple areas of engineering with a hands on approach. So, first thing to do: catching on a remote control and flying a quadcopter in a suitable place in order to feel and understand how it works.
This course can be complemented by the Bachelor’s Thesis.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>40.00%</th>
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<tbody>
<tr>
<td></td>
<td>Self study:</td>
<td>45h</td>
<td>60.00%</td>
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## Content

### Module 1: UAV Basics

**Learning time:** 10h  
Theory classes: 5h  
Self study: 5h

<table>
<thead>
<tr>
<th>Description</th>
<th>Related activities</th>
</tr>
</thead>
</table>
| Introduction to UAVs and how they work | Activity 1  
Project, part 1 |

### Module 2: UAV capabilities

**Learning time:** 15h  
Theory classes: 5h  
Self study: 10h

<table>
<thead>
<tr>
<th>Description</th>
<th>Related activities</th>
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</table>
| Understanding the capabilities of UAVs and their complexity | Activity 2  
Project, part 2 |

### Module 3: Using and improving UAVs

**Learning time:** 50h  
Theory classes: 20h  
Self study: 30h

<table>
<thead>
<tr>
<th>Description</th>
<th>Related activities</th>
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</table>
| Design and develop an R&D project using or improving a UAV | Activity 1  
Project, part 1  
Project, part 2  
Project, part 3 |

## Qualification system

The final grade depends on the following assessment criteria:

- Activity 1, weight: 20%
- Activity 2, weight: 20%
- Project, part 1: weight: 20%
- Project, part 2: weight: 20%
- Project, part 3: weight: 20%

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