205222 - Uav Generative Design

The main objective of the course is to understand how drones can be designed and manufactured with the new generative design. In order to do so students will develop a project that consists on doing a generative design of a drone and manufacturing it. This project integrates knowledge of multiple areas of engineering with a hands on approach.

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2019
Degree: BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: English

Teaching staff
Coordinator: ORIOL LORDAN GONZALEZ
Others: Primer quadrimestre:
ORIOL LORDAN GONZALEZ - 1

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 generative design and 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 a UAV.
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 drones can be designed and manufactured with the new generative design. In order to do so students will develop a project that consists on doing a generative design of a drone and manufacturing it. This project integrates knowledge of multiple areas of engineering with a hands on approach.
course is supported by HP with invited teachers and 3D printings for the final design.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>60h</th>
<th>40.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
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<td>0.00%</td>
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<td></td>
<td>Hours small group:</td>
<td>0h</td>
<td>0.00%</td>
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<td></td>
<td>Guided activities:</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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### Content

#### Module 1: Introduction

<table>
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<th>Learning time: 50h</th>
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<tbody>
<tr>
<td>Theory classes: 20h</td>
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<td>Self study: 30h</td>
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**Description:**
1. Introduction to generative design and UAV specifications

**Related activities:**
Deliverable

#### Module 2: UAV Design

<table>
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<th>Learning time: 75h</th>
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<td>Theory classes: 30h</td>
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<td>Self study: 45h</td>
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**Description:**
2. Design an UAV for 3D printing

**Related activities:**
Deliverable

#### Module 3: UAV Building

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<th>Learning time: 25h</th>
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<td>Theory classes: 10h</td>
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<td>Self study: 15h</td>
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**Description:**
3. 3D print and assemble an UAV

**Related activities:**
Deliverable
The final grade depends on the following assessment criteria:

- Deliverable 1: 20%
- Deliverable 2: 20%
- Project, part 1: 20%
- Project, part 2: 20%
- Project, part 3: 20%

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

Bibliography