205061 - Introduction to Active Flow Control

**Coordinating unit:** 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering

**Teaching unit:** 729 - MF - Department of Fluid Mechanics

**Academic year:** 2018

**Degree:**
- MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
- MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
- MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)

**ECTS credits:** 3  
**Teaching languages:** English

**Teaching staff**

**Coordinator:** Josep M Bergadà

**Teaching methodology**

Classes will be done via using power point or similar, the class will be active therefore the students will need to participate

**Learning objectives of the subject**

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group: 27h</th>
<th>36.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 0h</td>
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<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 48h</td>
<td>64.00%</td>
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# 205061 - Introduction to Active Flow Control

<table>
<thead>
<tr>
<th>Module</th>
<th>Learning time: 4h</th>
<th>Learning time: 24h</th>
<th>Learning time: 12h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
<td>Theory classes: 8h</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study: 2h</td>
<td>Self study: 16h</td>
<td>Self study: 6h</td>
</tr>
</tbody>
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## Module 1

### Description:
Active versus passive flow control.

### Related activities:
Search information regarding actual applications of each control.

## Module 2

### Description:
Fluidic oscillators. Evaluation of all existing devices an the field of its possible application.

### Related activities:
The students will simulate the performance of one of these devices.

## Module 3

### Description:
Boundary layer theory

### Related activities:
Students will learn the boundary layer main equations and how the boundary layer modification is affecting the forces acting on the body.
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### Module 4

<table>
<thead>
<tr>
<th>Learning time: 35h</th>
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<tbody>
<tr>
<td>Theory classes: 11h</td>
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<tr>
<td>Self study: 24h</td>
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</table>

### Description:
Different applications of Active Flow control

### Related activities:
In this module it will be analyzed the different applications of AFC, the ones existing, the ones expected and other possible future applications. The idea is to simulate a given case to observe the benefits and drawbacks of AFC.

### Qualification system

The evaluation will be performed based on the assignments the students will undertake. Two or three assignments will be done in groups of 3 people.

### Bibliography