Course guides
220026 - DGTCM - Gas Dynamics and Heat and Mass Transfer

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 724 - MMT - Department of Heat Engines.
Degree: BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2020  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Carlos David Pérez Segarra
Others: Assensi Oliva Llena
Xavi Trias

PRIOR SKILLS

Basic knowledge of previous courses: mathematics (specially differential and integral calculus), physics, mechanics of continuous media, fluid mechanics, thermodynamics.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. GrETA/GrEVA - An adequate understanding of the following, as applied to engineering: concepts and laws that govern the processes of energy transfer, the movement of fluids, the mechanisms of heat transfer and phase transition, and their role in analysis of the main aerospace propulsion systems.

TEACHING METHODOLOGY

The language use in the lectures is principally Catalan. Spanish is also used.

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours large group</td>
<td>46,0</td>
<td>30.67</td>
</tr>
<tr>
<td>Hours small group</td>
<td>7,0</td>
<td>4.67</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>7,0</td>
<td>4.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### 1. Introduction. Heat transfer by conduction in solids

**Description:**

**Full-or-part-time:** 40h  
Theory classes: 17h  
Practical classes: 3h  
Self study: 20h

### 2. Heat transfer by radiation

**Description:**

**Full-or-part-time:** 22h  
Theory classes: 8h  
Practical classes: 2h  
Self study: 12h

### 3. Convection phenomena. Gas dynamics.

**Description:**

**Full-or-part-time:** 38h  
Theory classes: 16h  
Practical classes: 2h  
Self study: 20h

### 4. Combined problems

**Description:**

**Full-or-part-time:** 50h  
Theory classes: 5h  
Laboratory classes: 7h  
Self study: 38h

## ACTIVITIES

### THEORY SESSIONS

**Full-or-part-time:** 65h  
Theory classes: 25h  
Self study: 40h
EXERCISES SESSIONS

Full-or-part-time: 68h
Theory classes: 14h
Practical classes: 7h
Laboratory classes: 7h
Self study: 40h

PROJECT

Full-or-part-time: 10h
Self study: 10h

GRADING SYSTEM

First mid-term exam accounts for 40% of the final mark.
Control tests account for 10% of the final mark.
Final exam accounts for 50% of the final mark.

There is the possibility of increasing the final mark of the exams by presenting and defending optional numerical simulation projects developed during the course and under the guidance of the lecturers. In that case, a minimum final mark of 4.5 is required.

The result of the first mid-term exam could be recovered/improved in the final exam. The mark obtained due to the recovering process will replace the initial mark if, and only if, this mark is higher than the initial mark.

EXAMINATION RULES.

The exams will consist of theory and problems. It is not allowed to use any extra material, except the one delivered by the lecturers.
The use of mobile phones, smartwatches or similar devices, together with computers and programmable calculators, is also not allowed.

BIBLIOGRAPHY

Basic:

Complementary:
RESOURCES

Audiovisual material:
- Apunts realitzats pel professorat de l'assignatura