Course guide
220305 - 220305 - Rockets Combustion and Propulsion

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 724 - MMT - Department of Heat Engines.

Degree: MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Compulsory subject).

Academic year: 2022  ECTS Credits: 5.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Manel Quera Miró
Others: Borja Borràs Quintanal
        David Bermejo Plana

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE18. MUEA/MASE: The ability to design, execute and analyse propulsion systems tests and carry out the systems' entire certification process.
CE12. MUEA/MASE: Sufficient knowledge of advanced fluid mechanics, particularly experimental and numerical techniques used in fluid mechanics.
CE13. MUEA/MASE: Understanding and mastery of combustion and heat and mass transfer phenomena.

Basic:
CB06. Manage original concepts in research projects.
CB08. Generate decision from incomplete information assuming its social and ethical responsibilities.
CB10. Improve self-learning capacity

TEACHING METHODOLOGY

The teaching methodology is divided into three parts:
- Classroom activities: theory and exercises
- Computer classroom: computer practices with specific combustion and rocket software
- Self study work and exercises and activities.

In the classroom activities, the teaching staff will introduce the theoretical bases of the subject, concepts, methods and results illustrating them with convenient examples and requesting, where appropriate, the accomplishment of exercises to facilitate their understanding.

In the practical training session, the teaching staff will guide the student in the analysis and resolution of rocket combustion processes, using calculation programs. These sessions are planned to be held in the computer rooms that exist in the school. The methodology and the calculation tools treated (programs) will have to be used by the student in the resolution of combustion problems proposed by the teacher.

As a final activity of the subject, the student will have to work as a team on a topic related to the subject. This work will be presented in class and will be evaluated by the teaching staff.

In summary the teaching methodology is based on classroom activities (theory, problems) and on self-employed work carried out by the student outside the classroom (combustion problems, final work). The teaching staff will provide appropriate tutoring and monitoring of the activities and work done by the students.

LEARNING OBJECTIVES OF THE SUBJECT

A
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>15.0</td>
<td>12.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30.0</td>
<td>24.00</td>
</tr>
<tr>
<td>Self study</td>
<td>80.0</td>
<td>64.00</td>
</tr>
</tbody>
</table>

Total learning time: 125 h

CONTENTS

**title english**

**Description:**
content english

**Full-or-part-time:** 12h 30m
- Theory classes: 3h
- Laboratory classes: 1h 30m
- Self study: 8h

**title english**

**Description:**
content english

**Full-or-part-time:** 16h 40m
- Theory classes: 4h
- Laboratory classes: 2h
- Self study: 10h 40m

**title english**

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GRADING SYSTEM

There will be four evaluation tests:
- First evaluation (35%)
- Second evaluation (35%)
- Combustion problems (10%)
- Work (20%)

The work will be done in groups and will be presented in class.

For students who do not approve the first evaluation, a recovery exam will be made that will take place on the day of the second evaluation.

Recovery Exam Rules:
- Only the students who have suspended the first evaluation can attend the recovery exam
- Note maximum limited to 6.0 out of 10.0
- The final grade of the first evaluation will be the highest that the student obtains between the two exams (ordinary exam and recovery exam)

BIBLIOGRAPHY

Basic:

Complementary: