220004 - Physics I

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 748 - FIS - Department of Physics
Academic year: 2018
Degree: BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: JOSEP LLUIS FONT GARCIA

Degree competences to which the subject contributes

Specific:
1. Understanding and mastery of basic concepts about the general laws of mechanics, thermodynamics and electromagnetism fields and waves and their application to solving problems in engineering.

Transversal:
2. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

Teaching methodology

There will be theoretical lessons, developed in big group classes. The teacher will briefly introduce the general objectives of the chapter. After that, and with the aid of practical problems, the student will be leaded into active participation. The support material will be found in ATENEA: objectives, concepts, examples, evaluable activities and bibliography.

There will also be problem lessons, with smaller groups and laboratory practices where the basic concepts of scientific methodology will be introduced including the concept of scientific approximation. The size of the laboratory groups will be small and there will be a part of the laboratory that is going to have to be done outside it, individually or in groups.

Learning objectives of the subject

Give comprehension and control of basic concepts of physics, especially mechanics.
Give comprehension and control of basic concepts of algebra and vector calculus.
Give comprehension and control of basic concepts of particle and solid kinetics in plain movement.
Give comprehension and control of basic concepts of particle and solid dynamic laws.
Basic knowledge of fluid statics.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 32h</th>
<th>21.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group: 14h</td>
<td>Hours small group: 14h</td>
<td>9.33%</td>
</tr>
<tr>
<td>Self study: 90h</td>
<td></td>
<td>60.00%</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Theory classes: 3h</th>
<th>Practical classes: 1h</th>
<th>Laboratory classes: 4h</th>
<th>Self study: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 18h</td>
<td>Practical classes: 8h</td>
<td>Laboratory classes: 4h</td>
<td>Self study: 45h</td>
</tr>
<tr>
<td>Theory classes: 9h</td>
<td>Practical classes: 4h</td>
<td>Laboratory classes: 4h</td>
<td>Self study: 25h</td>
</tr>
<tr>
<td>Theory classes: 2h</td>
<td>Practical classes: 1h</td>
<td>Laboratory classes: 2h</td>
<td>Self study: 8h</td>
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</tbody>
</table>

### Content

1. **Vector and scalars**

   - **Learning time:** 20h
   - Theory classes: 3h
   - Practical classes: 1h
   - Laboratory classes: 4h
   - Self study: 12h

2. **Kinetics and dynamic of the particle and systems of particles.**

   - **Learning time:** 75h
   - Theory classes: 18h
   - Practical classes: 8h
   - Laboratory classes: 4h
   - Self study: 45h

3. **Solid kinetics and dynamic.**

   - **Learning time:** 42h
   - Theory classes: 9h
   - Practical classes: 4h
   - Laboratory classes: 4h
   - Self study: 25h

4. **Fluid statics.**

   - **Learning time:** 13h
   - Theory classes: 2h
   - Practical classes: 1h
   - Laboratory classes: 2h
   - Self study: 8h
## Planning of activities

<table>
<thead>
<tr>
<th>ACTIVITY 1: THEORY SESSIONS</th>
<th>Hours: 70h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 28h</td>
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<tr>
<td></td>
<td>Self study: 42h</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 2: CONTINUOUS EVALUATION</th>
<th>Hours: 8h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 4h</td>
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<tr>
<td></td>
<td>Self study: 4h</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 3: PRACTICAL SESSIONS</th>
<th>Hours: 44h</th>
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<tbody>
<tr>
<td></td>
<td>Practical classes: 14h</td>
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<td></td>
<td>Self study: 30h</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 4: STATICS AND DYNAMICS LABORATORY</th>
<th>Hours: 24h</th>
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<tbody>
<tr>
<td></td>
<td>Laboratory classes: 12h</td>
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<td></td>
<td>Self study: 12h</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 5: LABORATORY EXAM</th>
<th>Hours: 4h</th>
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<tbody>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<tr>
<td></td>
<td>Self study: 2h</td>
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<table>
<thead>
<tr>
<th>ACTIVITY 6: MID TERM EXAMS</th>
<th>Hours: 3h</th>
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<tr>
<td></td>
<td>Theory classes: 3h</td>
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### Qualification system

Global mark = 0.35*N1A+0.4*N2A+0.10*NL+0.15*NAC

The subject will foresee ways to recover an unsatisfactory mark in the midterm exam.

The acronyms represent:

NL: Laboratory grade.
N1A and N2A: First and second midterm exam.
NAC: Continuous evaluation mark

### Regulations for carrying out activities

If a student doesn't develop any activity it will be graded with a 0.
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Bibliography

Basic:


Complementary:


Others resources:

Hyperlink

http://atenea.upc.edu/moodle/
  Campus Digital

http://aransa.upc.es/
  Aransa

http://www.ehu.es
  EHU