220106 - Materials Technology

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

**Teaching unit:** 702 - CMEM - Department of Materials Science and Metallurgy

**Academic year:** 2018

**Degree:** BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)

**ECTS credits:** 4,5

**Teaching languages:** Catalan

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**Teaching staff**

**Coordinator:** M. Núria Salán Ballesteros

**Others:**
- Silvia Illescas Fernández
- Juan Muñoz, Jaime
- Abbasi, Hooman
- De Sousa Pais Antunes, Marcelo
- Castejón Galán, María Del Pilar

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**Opening hours**

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**Prior skills**

Knowledge and skills related to previous subject on Materials Science (220092) should be acquired previously.

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**Degree competences to which the subject contributes**

**Specific:**
- 2. An understanding of, and skills for applying, materials engineering.

**Transversal:**
- 1. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

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**Teaching methodology**

* Lecture sessions.
* Practical sessions (exercises and problems).
* Lab sessions.
* Self-study and doing exercises and activities.

In the content of the sessions, teachers will introduce the theoretical foundations of the subject, concepts, methods and illustrate with examples appropriate to facilitate understanding.

In practical sessions in the classroom, teachers guide students in applying theoretical concepts to problem solving, based on critical thinking at all times. The exercises will be proposed that students solve exercises in the classroom and outside the classroom, to promote contact and use the basic tools needed to solve problems.

There will be practices related to the theoretical and practical aspects of the subject in order to understand the main concepts.

The student should study autonomously to assimilate and establish the basics concepts, solve exercises and prepare reports.
220106 - Materials Technology

**Learning objectives of the subject**

To provide students with advanced knowledge on the structure, properties and processing methods of the main materials of industrial application.

Understand technological features, optimization techniques and treatments of different materials and processed necessary to modify their properties.

Have appropriate criteria for the selection of materials and processing methods that should be considered in terms of its future application.

Get the main methods of testing materials and the most common techniques of inspection and control, as well as the most common defects that can present the components developed and its influence on the final properties or in the service response.

Transmit the importance of behaviour and good use of materials, be able to recognize its problems and make the appropriate treatment.

Select processes more efficient processing of materials, from the environmental point of view.

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group:</th>
<th>31h</th>
<th>27.56%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
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<td>0.00%</td>
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<tr>
<td>Hours small group:</td>
<td>14h</td>
<td></td>
<td>12.44%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td></td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>67h 30m</td>
<td></td>
<td>60.00%</td>
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<tr>
<td>Module 1: Metals, metal alloys and its forming</td>
<td>Learning time: 42h 30m</td>
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<tr>
<td></td>
<td>Theory classes: 12h</td>
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<td>Practical classes: 0h</td>
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<tr>
<td></td>
<td>Laboratory classes: 6h</td>
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<td></td>
<td>Self study : 24h 30m</td>
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<thead>
<tr>
<th>Module 2: Ceramic materials, glass and its forming</th>
<th>Learning time: 12h 30m</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 3h 30m</td>
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<tr>
<td></td>
<td>Self study : 9h</td>
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<table>
<thead>
<tr>
<th>Module 3: polymers materials and composite and its forming</th>
<th>Learning time: 31h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 9h 30m</td>
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<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<td></td>
<td>Self study : 19h 30m</td>
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<tr>
<th>Module 4: Behaviour in Service</th>
<th>Learning time: 26h 30m</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
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<tr>
<td></td>
<td>Laboratory classes: 6h</td>
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<tr>
<td></td>
<td>Self study : 14h 30m</td>
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</tbody>
</table>
## Planning of activities

| ACTIVITY 1 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Self study: 2h |
|------------------------|--------------------|
| ACTIVITY 2 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Self study: 2h |
| ACTIVITY 3 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Theory classes: 2h |
| ACTIVITY 4 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Self study: 2h |
| ACTIVITY 5 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Self study: 2h |
| ACTIVITY 6 - PRACTICES | Hours: 4h  
Laboratory classes: 2h  
Self study: 2h |
| ACTIVITY 7 - PRACTICES | Hours: 5h 30m  
Laboratory classes: 2h  
Self study: 3h 30m |
| ACTIVITY 8 - EVALUATION | Hours: 2h 30m  
Theory classes: 2h 30m |
| ACTIVITY 9 - EVALUATION | Hours: 2h 30m  
Theory classes: 2h 30m |
ACTIVITY 10 - WORK / ARTICLE

| Hours | Self study: 8h |

LARGE GROUP SESSIONS / THEORY

| Hours | Theory classes: 26h  |
|       | Self study: 44h    |

Qualification system

- First partial: 40%
- Second partial: 40%
- Practice: 10%
- Work-article: 10%

The student who suspends, wishes to improve note or cannot attend the examination of contents of Part 1, will have the opportunity to examine this part the same day indicated in the final exam calendar, coinciding with the test of Contents of the 2nd Partial. It is necessary to communicate the willingness to do this partial retrieval exam by email to the lecturers in theory, prior to the 2nd Part exam. Those who have to examine the contents of 1st + 2nd partial, will have a special test, with contents of both parts, which will be done coinciding with the test of the 2nd part (day, time and space). The new note of the recovery exam will replace the old one only in case it is higher.

Regulations for carrying out activities

The tests are performed in writing, in Spanish or Catalan

Bibliography

Basic:


