820422 - CEMM - Materials Science and Technology

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 702 - CMEM - Department of Materials Science and Metallurgy
Academic year: 2018
Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: JORDI LLUMA FUENTES
Others: JORDI LLUMA FUENTES - JORDI JORBA PEIRÓ

Opening hours
Timetable: see ftp://ftp-urgell.upc.es/Materials/Inici.htm

Requirements
Materials Science & Technology
Chemistry
Elasticity and Resistance of Materials I

Degree competences to which the subject contributes

Specific:
2. Understand and apply materials engineering techniques.

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology
The course uses about:
-23% Expository lectures (theory), taught in Catalan.
-13% Classroom work aimed (problems or exams), taught in Catalan.
-7% Practical work (labs).
-57% Self (study).

Learning objectives of the subject
At the end of the course the student should be able to:
• Distinguish and relate the structure of materials with their properties and applications.
• Understand and apply standards of materials tests.
# Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 45h</th>
<th>30.00%</th>
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<tr>
<td></td>
<td>Hours medium group: 0h</td>
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<tr>
<td></td>
<td>Hours small group: 15h</td>
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<td>Guided activities: 0h</td>
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<td>Self study: 90h</td>
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| **(ENG) Microestructura, diagrames de fase i disseny amb materials,** | **Learning time:** 45h 40m  
Theory classes: 14h  
Laboratory classes: 2h  
Self study: 29h 40m |
| **(ENG) Metalls.** | **Learning time:** 36h 10m  
Theory classes: 11h  
Laboratory classes: 4h  
Self study: 21h 10m |
| **(ENG) Ceràmiques i vidres.** | **Learning time:** 23h 50m  
Theory classes: 7h  
Laboratory classes: 2h  
Self study: 14h 50m |
| **(ENG) Polímers i materials compostos.** | **Learning time:** 27h 50m  
Theory classes: 9h  
Laboratory classes: 2h  
Self study: 16h 50m |

| Materials selection and analysis of failures. | **Learning time:** 16h 30m  
Theory classes: 6h  
Laboratory classes: 2h  
Self study: 8h 30m |

**Description:**  
Selection charts with shape.  
Examples of selection with shape.  
Failure analysis.

**Related activities:**  
Practice 5. Determination of quality criteria using non-destructive inspection (ultrasounds and induced currents).  
Final test.

**Specific objectives:**  
Select the best material (or family of materials) that covers a set of properties. Having assimilated the basic concepts of analysis of failures in the design.
Qualification system

2 partial exams with a weight of 35% the 1st control and 40% the 2nd control.
Practices: 20%
Skill self-study: 5%

Regulations for carrying out activities

In general you can bring any supporting material for conducting the problem part of the test and nothing for the theoretical part or the reevaluation.
Devices that can be used to communicate are explicitly excluded.

Bibliography

Basic:


Complementary:
