

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:	2016
Degree:	BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) 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
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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.



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Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours medium group:	0h	0.00%
	Hours small group:	15h	10.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

(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
<p>Description: Selection charts with shape. Examples of selection with shape. Failure analysis.</p> <p>Related activities: Practice 5. Determination of quality criteria using non-destructive inspection (ultrasounds and induced currents). Final test.</p> <p>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.</p>	

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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:

Ashby, M. F.; Jones, David R. H. Materiales para ingeniería, vol. 2. Barcelona [etc.]: Reverté, 2008-2009. ISBN 9788429172560.

Mangonon, Pat L. Ciencia de materiales : selección y diseño. México [etc.]: Prentice Hall, 2001. ISBN 9702600278.

Complementary:

Ashby, M. F.; Jones, David R. H. Materiales para ingeniería, vol. 1. Barcelona [etc.]: Reverté, 2008-2009. ISBN 9788429172553.

Kalpakjian, Serope; Schmid, Steven R. Manufactura, ingeniería y tecnología. 5ª ed. México [etc.]: Pearson Educación, cop. 2008. ISBN 9789702610267.