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330133 - SMA - Material Selection

Coordinating unit: 330 - EPSEM - Manresa School of Engineering

Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering

Academic year: 2019

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

ECTS credits: 6 Teaching languages: Catalan, Spanish, English

Teaching staff

Coordinator: MARIA DOLORES RIERA COLOM

Others: MARC ANTONI SOLER CONDE

Degree competences to which the subject contributes

Specific:

1. (ENG) Seleccionar el material més adient per a aplicacions bàsicament estructurals.

Transversal:

2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.
4. 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.

Learning objectives of the subject

Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

(ENG) 1. Els materials en el disseny	Learning time: 1h Theory classes: 1h
(ENG) 2. El procés de disseny	Learning time: 1h Theory classes: 1h
(ENG) 3. Materials per a l'enginyeria i les seves propietats	Learning time: 12h Theory classes: 4h Laboratory classes: 3h Self study : 5h
(ENG) 4. Mapes de propietats	Learning time: 29h Theory classes: 4h Laboratory classes: 10h Self study : 15h
(ENG) 5. Selecció de materials	Learning time: 50h Theory classes: 10h Laboratory classes: 10h Self study : 30h
(ENG) 6. Processat i selecció del procés de conformat	Learning time: 23h Theory classes: 3h Laboratory classes: 5h Self study : 15h
(ENG) 7. Informació pel disseny	Learning time: 1h Theory classes: 1h

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(ENG) 8. Materials i entorn	Learning time: 8h Theory classes: 1h Laboratory classes: 2h Self study : 5h

(ENG) 9. Materials i disseny industrial	Learning time: 4h Theory classes: 4h

(ENG) 10. Forces pel canvi	Learning time: 1h Theory classes: 1h

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Planning of activities

(ENG) A.1. SEMINARI SOBRE "PREU, COST I DISPONIBILITAT DELS MATERIALS"	Hours: 1h Theory classes: 1h
(ENG) A.2. EXERCICIS INDIVIDUALS SOBRE PROPIETATS DELS MATERIALS	Hours: 5h Self study: 5h
(ENG) A.3. EXERCICIS INDIVIDUALS D'APLICACIÓ DELS MAPES DE PROPIETATS	Hours: 15h Self study: 15h
(ENG) A.4. EXERCICIS INDIVIDUALS DE SELECCIÓ DE MATERIALS	Hours: 10h Self study: 10h
(ENG) A.5. TREBALL DE SELECCIÓ DE MATERIALS AMB ORDINADOR	Hours: 20h Self study: 20h
(ENG) A.6. TREBALL DE SELECCIÓ DEL PROCÉS DE CONFORMAT	Hours: 15h Self study: 15h
(ENG) A.7. TREBALL SOBRE ECO-SELECCIÓ	Hours: 5h Self study: 5h
(ENG) A. 8. PROVA AVALUATIVA DE PROGRÉS I	Hours: 12h Theory classes: 2h Self study: 10h
(ENG) A. 9. PROVA AVALUATIVA DE PROGRÉS II	Hours: 12h Theory classes: 2h Self study: 10h

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Bibliography

Basic:

Ashby, M.F. Materials selection in mechanical design [on line]. 4thd edition. Burlington: Butterworth-Henemann, 2011 [Consultation: 18/06/2019]. Available on: <https://discovery.upc.edu/iii/encore/record/C__Rb1437674?lang=cat>. ISBN 9781856176637.

Complementary:

Dieter, G. E. Mechanical metallurgy : metri. 3th Revised. New York: McGraw-Hill Book Company, 1988. ISBN 9780071004060.

Ashby, M.F. ; Jones, D. R. H. Materiales para ingeniería 1: Introducción a las propiedades, las aplicaciones y el diseño. Barcelona: Reverté, 2008. ISBN 9788429172553.

Ashby, M. F.; Jones, D. R. H. Materiales para ingeniería 2: Introducción a la microestructura, el procesamiento y el diseño. Madrid: Reverté, 2009. ISBN 9788429172560.

Hosford, W.F.; Caddell, R.M. Metal forming: mechanics and metallurgy. 4th ed. Cambridge: Cambridge University Press, 2011. ISBN 9781107004528.

Mangonon, P. L.. Ciencia de materiales : selección y diseño. México: Prentice-Hall, 2001. ISBN 9702600278.

Others resources: