Last update: 03-07-2019

330060 - CTM - Materials Science and Technology

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 ENERGY AND MINING RESOURCE ENGINEERING (Syllabus 2012). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2016). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2016). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2016). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN ICT SYSTEMS ENGINEERING (Syllabus 2010). (Teaching unit Optional)

ECTS credits: 6 Teaching languages: Catalan

Teaching staff

Coordinator: MARC ANTONI SOLER CONDE

Degree competences to which the subject contributes

Specific:

1. (ENG) Coneixement dels fonaments de ciència, tecnologia i química dels materials. Entendre la relació entre la microestructura, la síntesi o processat i les propietats dels materials.

Transversal:

2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Learning objectives of the subject

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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) 1. ÀTOMS, MOLÈCULES I ENLLAÇ	Learning time: 2h Theory classes: 2h
(ENG) 2. ESTRUCTURA DELS MATERIALS	Learning time: 3h Theory classes: 3h
(ENG) 3. IMPERFECCIONS DE L'ESTRUCTURA CRISTAL·LINA	Learning time: 2h Theory classes: 2h
(ENG) 4. PROPIETATS MECÀNIQUES I ASSAIGS	Learning time: 6h Theory classes: 6h
(ENG) 5. DEFORMACIÓ I MECANISMES D'ENDURIMENT	Learning time: 3h Theory classes: 3h
(ENG) 6. DIFUSIÓ	Learning time: 3h Theory classes: 3h
(ENG) 7. DIAGRAMES DE FASES	Learning time: 3h Theory classes: 3h
(ENG) 8. TRACTAMENT TÈRMICS	Learning time: 4h Theory classes: 4h

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(ENG) 9. PROPIETATS ELÈCTRIQUES I MAGNÈTIQUES	Learning time: 3h Theory classes: 3h
(ENG) 10. METALLS	Learning time: 2h Theory classes: 2h
(ENG) 11. CERÀMICS	Learning time: 2h Theory classes: 2h
(ENG) 12. POLÍMERS	Learning time: 2h Theory classes: 2h
(ENG) 13. COMPÒSITS	Learning time: 2h Theory classes: 2h
(ENG) 14. CORROSIÓ	Learning time: 2h Theory classes: 2h

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Planning of activities

(ENG) 1. PRÀCTICA SIMULACIÓ	Hours: 4h Laboratory classes: 2h Self study: 2h
(ENG) 2. PRÀCTICA METAL·LOGRAFIA / ASSAIGS MECÀNICS	Hours: 4h Laboratory classes: 2h Self study: 2h
(ENG) 3. PRÀCTICA TRACTAMENTS TÈRMICS	Hours: 4h Laboratory classes: 2h Self study: 2h
(ENG) 4. PRÀCTICA CORROSIÓ /POLÍMERS	Hours: 4h Laboratory classes: 2h Self study: 2h
(ENG) 5. TREBALL GRUP	Hours: 10h Laboratory classes: 2h Self study: 8h
(ENG) 6. ASSAIG TRACCIÓ	Hours: 6h Guided activities: 3h Self study: 3h
(ENG) 7. ANÀLISI D'IMATGE I METAL·LOGRAFIA	Hours: 3h Self study: 3h
(ENG) 8. PROBLEMA SIMULACIÓ	Hours: 3h Self study: 3h
(ENG) 9. QÜESTIONARI PRÀCTICA CORROSIÓ/POLÍMERS	Hours: 3h Self study: 3h

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(ENG) 10. PROVA AVALUATIVA DE PROGRÉS	Hours: 21h Theory classes: 3h Self study: 18h
(ENG) 11. PROVA AVALUATIVA D'INTEGRACIÓ	Hours: 31h Theory classes: 3h Self study: 28h
(ENG) 12. QÜESTIONARI DIAGRAMES DE FASES	Hours: 3h Self study: 3h
(ENG) 13. ÚS SOLVENT DE LA INFORMACIÓ	Hours: 3h 30m Laboratory classes: 2h Self study: 1h 30m
(ENG) 14. QÜESTIONARI ÚS SOLVENT DE LA INFORMACIÓ	Hours: 2h Self study: 2h
(ENG) 15. TREBALL ÚS SOLVENT DE LA INFORMACIÓ	Hours: 2h Self study: 2h

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Bibliography

Basic:

Callister, William D.; Rethwisch, David G. Ciencia e ingeniería de los materiales. 2ª ed. Barcelona: Reverté, 2016. ISBN 9788429172515.

Van Vlack, Lawrence H. Elements of materials science and engineering. 6th ed. Reading, Massachusetts: Addison-Wesley, 1989. ISBN 0201528223.

Complementary:

Askeland, Donald R. Ciencia e ingeniería de los materiales. Madrid: International Thomson Editores, 2001. ISBN 8497320166.

Smith, William Fortune; Hashemi, Javad. Fundamentos de la ciencia e ingeniería de materiales. 5ª ed. México: McGraw-Hill, 2014. ISBN 9786071511522.

Shackelford, James F. Introducción a la ciencia de materiales para ingenieros. 7ª ed. Madrid: Pearson educación, 2010. ISBN 9788483226599.

Flinn, Richard A.; Trojan, Paul K. Materiales de ingeniería y sus aplicaciones. 3ª ed. Bogotá: McGraw-Hill, 1989. ISBN 958600032X.

Others resources: