Course guide
330415 - EMA - Materials Engineering

Last modified: 28/04/2025

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

Degree: BACHELOR'S DEGREE IN MINING ENGINEERING (Syllabus 2016). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Riera Colom, Maria Dolores

Others: Soler Conde, Marc Antoni

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Knowledge of the mechanical behavior in service of the materials.
2. Know the basic processes of forming different types of engineering materials.
3. Select the most suitable material for basically structural applications.

Transversal:
4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
5. 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.
6. 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.
7. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours medium group	60,0	40.00

Total learning time: 150 h

CONTENTS

title english

Description:
content english

Full-or-part-time: 2h
Theory classes: 2h

title english

Description:
content english

Full-or-part-time: 3h
Theory classes: 3h

title english

Description:
content english

Full-or-part-time: 8h
Theory classes: 4h
Laboratory classes: 1h
Self study : 3h

title english

Description:
content english

Full-or-part-time: 2h
Theory classes: 2h

title english

Description:
content english

Full-or-part-time: 14h
Theory classes: 4h
Laboratory classes: 4h
Self study : 6h

title english

Description:
content english

Full-or-part-time: 17h
Theory classes: 8h
Laboratory classes: 4h
Self study : 5h

title english

Description:
content english

Full-or-part-time: 4h
Theory classes: 4h

title english

Description:
content english

Full-or-part-time: 36h
Theory classes: 6h
Laboratory classes: 6h
Self study : 24h

title english

Description:
content english

Full-or-part-time: 2h
Theory classes: 2h

title english

Description:
content english

Full-or-part-time: 15h
Theory classes: 3h
Self study : 12h

title english

Description:
content english

Full-or-part-time: 3h
Theory classes: 3h

ACTIVITIES

name english

Full-or-part-time: 1h
Laboratory classes: 1h

name english

Full-or-part-time: 3h
Self study: 3h

name english

Full-or-part-time: 4h
Laboratory classes: 4h

name english

Full-or-part-time: 6h
Self study: 6h

name english

Full-or-part-time: 4h
Laboratory classes: 4h

name english

Full-or-part-time: 5h
Self study: 5h

name english

Full-or-part-time: 6h
Laboratory classes: 6h

name english

Full-or-part-time: 6h
Self study: 6h

name english

Full-or-part-time: 22h
Theory classes: 2h
Self study: 20h

name english

Full-or-part-time: 18h
Self study: 18h

name english

Full-or-part-time: 12h
Self study: 12h

name english

Full-or-part-time: 22h
Theory classes: 2h
Self study: 20h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:
- Ashby, M. F.; Jones, David R. H. Materiales para ingeniería. Vol. 1, Introducción a las propiedades, las aplicaciones y el diseño [on line]. Barcelona: Reverté, 2008-2009 [Consultation: 27/05/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=5635457. ISBN 9788429172553.
- Ashby, M. F.; Jones, David R. H. Materiales para ingeniería. Vol. 2, Introducción a la microestructura, el procesamiento y el diseño [on line]. Barcelona: Reverté, 2008-2009 [Consultation: 14/06/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=7725. ISBN 9788429172560.

Complementary:
- Dieter, George Ellwood; Bacon, David. Mechanical metallurgy. SI Metric ed. London: McGraw-Hill Book Company, 1988. ISBN 0071004068.
- Anglada, M. J., ed. Fractura de materiales [on line]. Barcelona: Edicions UPC, 2002 [Consultation: 12/11/2020]. Available on: http://hdl.handle.net/2099.3/36175. ISBN 8483015927.
- Hosford, William F.; Caddell, Robert M. Metal forming: mechanics and metallurgy. 4th ed. Cambridge: Cambridge University, 2011. ISBN 9781107004528.
- Gilbert, Marianne. Brydson's plastics materials [on line]. 8th ed. Butterworth-Heinemann: Amsterdam, 2017 [Consultation: 10/06/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780323358248/brydsons-plastics-materials. ISBN 9780323358248.
- Black, J. T.; Kohser, R. A. DeGarmo's materials and processes in manufacturing. 11th ed. Hoboken: Wiley, 2013. ISBN 9780470873755.

- Miracle, D. B.; Donaldson, S. L., eds. ASM Handbook. Vol. 21, Composites [on line]. Ohio: ASM International, 2001 [Consultation: 07/10/2025]. Available on: https://archive.org/details/0222-pdf-asm-metals-hand-book-volume-21-composites/page/n333/mode/2up. ISBN 9780871707031.
- ASM International Handbook Committee, dir. Ceramics and glasses. Metal Park, Ohio: ASM International. The Materials Information Society, 1991. ISBN 0871702827.
- Kobayashi, Shiro; Oh, Soo-Ik; Altan, Taylan. Metal forming and the finite-element method. New York: Oxford University Press, 1989. ISBN 9780195044027.
- Shackelford, James F.; Güemes, Alfredo; Martín, Núria. Introducción a la ciencia de materiales para ingenieros [on line]. 7ª ed. Madrid: Pearson Educación, 2010 [Consultation: 02/06/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=1258. ISBN 9788483226599.