

220042 - Materials Characterization and Surface Engineering

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| Coordinating unit: | 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering | | |
| Teaching unit: | 702 - CMEM - Department of Materials Science and Metallurgy | | |
| Academic year: | 2019 | | |
| Degree: | BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional) | | |
| ECTS credits: | 3 | Teaching languages: | English |

Teaching staff

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| Coordinator: | MARIA NURIA SALAN BALLESTEROS - ELISA RUPEREZ DE GRACIA |
| Others: | Juan Muñoz, Jaime |

Opening hours

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| Timetable: | Tuesday and Thursday from 11 to 14 h |
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Degree competences to which the subject contributes

Specific:

1. An understanding of the fundamentals of science, technology and materials chemistry, as well as the relationship between microstructure, synthesis and processing and the properties of materials.

Teaching methodology

The course is divided into parts:

Theory classes

Practical classes

Self-study for doing exercises and activities.

In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.

In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.

Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

The teachers provide the curriculum and monitoring of activities (by ATENEA).

Learning objectives of the subject

Know the different techniques of study, analysis and characterization of materials, and the differences between them in order to make a correct choice in case of requirement.

Learn about the latest advances in coatings and different uilitats of each.

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Study load

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| Total learning time: 75h | Hours large group: | 30h | 40.00% |
| | Self study: | 45h | 60.00% |

Content

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| Module 1: Materials Characterisation Techniques | Learning time: 50h Theory classes: 20h Self study : 30h |
| Description: * Optical Microscopy (OM, STEREOSCOPIC) * Electronic Microscopy (SEM, TEM) * Other techniques (CONFOCAL, AFM, FIB) | |
| Module 2: Surface Engineering | Learning time: 25h Theory classes: 10h Self study : 15h |
| Description: * PVD, CVD * TBC (Thermal Barrier Coatings) * DLC (Diamond Like Coatings) | |

Qualification system

Deliverable module I: 30%
 Deliverable module II: 30%
 Teamwork: 40%

Bibliography