Course guide
295767 - 295EM131 - Materials with Applications in Transport and Energy

Unit in charge: Barcelona East School of Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.

Degree:
ERASMUS MUNDUS MASTER'S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2014). (Optional subject).
MASTER'S DEGREE IN MATERIALS SCIENCE AND ADVANCED MATERIALS ENGINEERING (Syllabus 2019). (Optional subject).
ERASMUS MUNDUS MASTER'S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2021). (Optional subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: Spanish

LECTURER

Coordinating lecturer: Antonio Mateo
Others: Antonio Mateo, Pablo Guardia i Jessica Calvo

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEMCEAM-02. (ENG) Aplicar métodos innovadores para el diseño, simulación, optimización y control de procesos de producción y transformación de materiales

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

Transportation is an engineering field where the correct selection of materials is vital for the performance of vehicles. The students should understand the specific requirements of critical components in vehicles, translate them into materials' properties and select among the existing materials the ones able to fulfill the specifications.

Concerning Energy, the three main topics are:
- Materials for energy conversion
- Materials for energy storage
- Materials for fuel production

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>4.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>28,0</td>
<td>18.67</td>
</tr>
<tr>
<td>Self study</td>
<td>102,0</td>
<td>68.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>14,0</td>
<td>9.33</td>
</tr>
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Total learning time: 150 h
## Automotive materials

**Description:**
Els materials amb aplicacions automobilístiques es divideixen en dos grans blocs: Materials per la carroceria o BIW (Body in white), principalment acers d’alta resistència i aluminis Materials pel motor: cada part, tant interna com externa del motor té uns requeriments en servei que porten a la selecció d’un determinat material i procés de fabricació. Es detallaran per Bloc motor, Pistons i anelles de retenció, Vàlvules, Cigonyal i arbre de lleves.

**Full-or-part-time:** 33h  
Theory classes: 10h  
Laboratory classes: 1h 30m  
Guided activities: 1h 30m  
Self study : 20h

## Aerospace Materials

**Description:**
content english

**Full-or-part-time:** 33h  
Theory classes: 10h  
Laboratory classes: 1h 30m  
Guided activities: 1h 30m  
Self study : 20h

## Train materials

**Description:**
content english

**Full-or-part-time:** 16h 30m  
Theory classes: 4h 30m  
Practical classes: 2h  
Self study : 10h

## Sea transport materials

**Description:**
content english

**Full-or-part-time:** 16h 30m  
Theory classes: 4h 30m  
Guided activities: 2h  
Self study : 10h
Description:
Materials for energy conversion
Materials for energy storage
Materials for fuel production

**Full-or-part-time:** 49h 30m
Theory classes: 15h
Laboratory classes: 1h 30m
Guided activities: 3h
Self study: 30h

**GRADING SYSTEM**

**BIBLIOGRAPHY**

**Basic:**