240EM121 - Advanced Ceramic Materials and Inorganic Matrix Composites

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 702 - CMEM - Department of Materials Science and Metallurgy
Academic year: 2017
Degree: ERASMUS MUNDUS MASTER’S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2014). (Teaching unit Optional)
MASTER’S DEGREE IN MATERIALS SCIENCE AND ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ERASMUS MUNDUS MASTER’S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2009). (Teaching unit Optional)
MASTER’S DEGREE IN MATERIALS SCIENCE AND ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ERASMUS MUNDUS MASTER’S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 4.5
Teaching languages: English

Teaching staff
Coordinator: MARCOS JUAN ANGLADA GOMILA

Opening hours
Timetable: To be agreed according to the time-table and lecturer at the beginning of the course

Prior skills
General background in Materials Science and Engineering as required for admission to the master programme.

Requirements
General background in Materials Science and Engineering as required for admission to the master programme.

Teaching methodology
Conventional lectures

Learning objectives of the subject

Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group: 27h</th>
<th>24.00%</th>
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</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>13h 30m</td>
<td>12.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>72h</td>
<td>64.00%</td>
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Content

<table>
<thead>
<tr>
<th>title english</th>
<th>Learning time: 1h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 1h</td>
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Description:
1. INTRODUCTION TO CERAMICS AND METAL MATRIX COMPOSITES (MMC)
2. ADVANCED PROCESSING OF CERAMICS
3. PROCESSING OF CARBON, BORON AND ALUMINA FIBERS
4. PROCESSING OF NON OXIDE FIBERS
5. STRENGTH BY FLEXURE OF CERAMICS. STRENGTH DISTRIBUTION
6. R-CURVE IN CERAMICS. TOUGHENING MECHANISMS IN CERAMICS
7. SUBCRITICAL CRACK GROWTH AND THERMAL STRESSES IN CERAMICS
8. LIQUID STATE PROCESSING. SOLID STATE PROCESSING AND SECONDARY PROCESSING OF MMC
9. PHYSICAL PROPERTIES AND THERMAL STRESSES OF MMC
10. INTERFACE
11. ELASTIC MODULUS OF MMC
12. MONOTONIC BEHAVIOUR OF MMC
13. FRACTURE RESISTANCE OF MMC

Related activities:
Preparation and presentation in class of a specific subject assigned to the students during the first part of the course. Each work has to be prepared by one student and be defended during the last weeks of the course. The weight of the report in the mark of the course is 20 %.

Qualification system

Exam of first 50 % of programme (40 % weight)
Exam of second 50% of programme (60% weight)
Exam of 100 % of the programme.

Regulations for carrying out activities

In general, the exams are carried out without students having access to documents (books, notes, etc.). But in some occasions depending of the type of exam, they may be allowed.

Bibliography

Basic: