

Course guide

240IMA32 - 240IMA32 - Materials with Transport Applications

Last modified: 16/05/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).
Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Catalan, Spanish, English

LECTURER

Coordinating lecturer: Mateo Garcia, Antonio Manuel

Others:

PRIOR SKILLS

The student must have some knowledge about mechanical properties, corrosion and degradation of materials, as well as the classification and main properties of metal alloys, polymers and composites.

REQUIREMENTS

Materiales and Tecnología de Materials of GETI or equivalents

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CEEMAT3. Design, calculate and model aspects related to the materials for mechanical components, structures and equipment.
CEEMAT4. Evaluate the life time of service, the reuse, the recovery and the recycling of products taking into account the characteristics of the materials which make up the material.

Transversal:

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

TEACHING METHODOLOGY

Theory classes, laboratory practices, presentations of works by students

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 fulfil the specifications.



STUDY LOAD

Type	Hours	Percentage
Hours large group	27,0	24.00
Self study	72,0	64.00
Hours small group	13,5	12.00

Total learning time: 112.5 h

CONTENTS

title english

Description:

Materials for automotive (bodywork and engines), for aeronautics (fuselage and turbines), for ships and for trains

Specific objectives:

Transportation is a field of engineering where the correct selection of materials is vital for vehicle performance. Students must understand the specific requirements of critical components in vehicles, translate them into material properties and select among the existing materials those that can meet the specifications.

Related activities:

Visits to companies in the sector, such as ALSTOM Transport, SEAT, etc

Full-or-part-time: 125h

Theory classes: 30h

Laboratory classes: 10h

Guided activities: 5h

Self study : 80h

GRADING SYSTEM

2 midterms, report of practical work and defense of the work

Recuperation exam

EXAMINATION RULES.

final qualification: 35% each midterm, 30% work.

recuperation replaces both midterms

BIBLIOGRAPHY

Basic:

- Davies, Geoffrey. Materials for automobile bodies [on line]. 2nd ed. Oxford: Butterworth-Heinemann, 2012 [Consultation: 22/12/2021]. Available on: <https://www.sciencedirect.com/book/9780080969794/materials-for-automobile-bodies>. ISBN 1283734931.

- Yamagata, Hiroshi. The science and technology of materials in automotive engines. Cambridge: Woodhead Pub., 2005. ISBN 1855737426.

- World Auto Steel. Advanced high-strength steels application guidelines [on line]. Middletown, OH: WorldAutoSteel, cop. 2021 [Consultation: 20/04/2023]. Available on: <https://ahssinsights.org/metallurgy/steel-grades/>.