69206 - Innovative materials in Architecture

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	519 - Master's in Architecture
ECTS	3.0
Year	1
Semester	First semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, problem-solving, case studies, laboratory sessions, visits, seminars by professionals, and an academic essay.

5.2.Learning tasks

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The course includes the following learning tasks:

- A01/A02 **Lectures, case studies,and seminars** given by professionals (organised by the Materials Science and Metallurgical Engineering department) (22 hours).
- A03 **Laboratory and practice sessions** (6 hours)
- A04 **Visits** (2 hours). Visits to companies or Materials Centres/Institutes/Museum that are relevant to the field of architecture.

5.3.Syllabus

The course will address the following topics:

Theory

1. Introduction: Innovative materials in Architecture
2. Metals and light alloys: Stainless Steels, CorTen Steels, Titanium, Aluminium, Copper and its alloys, Zinc...
3. Plastics: Thermoplastics, Thermosets, Elastomers, foams, textile architecture...
4. Polymer matrix composites: matrices and fibres. Laminates, sandwich elements...
5. Glass and ceramics
6. Smart materials. Uses and applications in industry and Architecture

Laboratory and practice sessions

1. Selection of materials: problems and use of CES (Cambridge Engineering Selector) data base
2. Testing of materials
3. Management of commercial catalogues or informative sheets of innovative materials

5.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

5.5.Bibliography and recommended resources

The course's bibliography is kept updated and is consulted at the Library website (search for recommended bibliography on biblioteca.unizar.es)

- Material Architecture: Emergent materials for innovating buildings and ecological construction, J. Fernández, Architectural Press (2006).
- Arquitectura y construcción, Dimitris Kottas, Links books, (2012).
- Smart Materials and Technologies for achitecture and design professions, M. Addington and D. Schodek, Architectural Press (2006).
- Materiales para Ingeniería 1: Introducción a las propiedades, las aplicaciones y el diseño, M.F. Ashby/D.R.H. Jones, Editorial Reverté, (2008).
- Material Innovation: Architecture, Andrew H. Dent, Leslie Sherr, Thames and Hudson (2014).
- Materials for Architects and Builders. Arthur Lyons, Taylor and Francis Group (2014).
- Revista TECTONICA: monografías de arquitectura, tecnología y construcción. http://www.tectonica.es/
- MATERFAD: Centro de Materiales (Barcelona): Base de datos de materiales. http://es.materfad.com/
- MATERIA: Global network in the area of innovative materials http://materia.nl/.
- Software Cambridge Engineering Selector (2000).