

## 69206 - Innovative materials in Architecture

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	110 - Escuela de Ingeniería y Arquitectura
<b>Degree</b>	519 - Master's in Architecture
<b>ECTS</b>	3.0
<b>Course</b>	1
<b>Period</b>	First semester
<b>Subject Type</b>	Optional
<b>Module</b>	---

### **1.Basic info**

#### **1.1.Recommendations to take this course**

#### **1.2.Activities and key dates for the course**

### **2.Initiation**

#### **2.1.Learning outcomes that define the subject**

#### **2.2.Introduction**

### **3.Context and competences**

#### **3.1.Goals**

#### **3.2.Context and meaning of the subject in the degree**

#### **3.3.Competences**

#### **3.4.Importance of learning outcomes**

### **4.Evaluation**

### **5.Activities and resources**

#### **5.1.General methodological presentation**

The designed learning method process for this subject is based on the following:

Attendance to lectures and problems classes and study cases.

Attendance to laboratory sessions and/or visits and/or seminars given by professionals.

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Usage of the explained and developed information in classes in order to carry out the supervised academic essay.

### 5.2.Learning activities

A01/A02. Lectures and problems classes, study cases in the classroom and seminars given by professionals, organised by the Materials Science and Metallurgical Engineering department (22 hours).

A03. Laboratory and practical sessions (6 hours)

A04. Special Activities: Visits to companies or Materials Centres/Institutes/Museum that are relevant to the field of architecture (2 hours)

### 5.3.Program

Theoretical contents

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, 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 practical sessions

1. Selection of materials: statement of the selection problem 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.Planning and scheduling

The course schedule, classroom and laboratory sessions, will be determined by the academic calendar that the Engineering and Architecture School will establish for the corresponding course. The exact dates for submission of academic works will be announced at the beginning of the course.

### 5.5.Bibliography and recommended resources

Usually, the previous academic course's bibliography is kept updated and is consulted by the Library website (search for recommended bibliography on [biblioteca.unizar.es](http://biblioteca.unizar.es))

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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 architecture 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).