

## MATERIALS SCIENCE (2021-22)

<b>Código:</b> D041	<b>Fecha de aprobación:</b> 09/01/2014	<b>Precio:</b> 39,27 1st registration credits
<b>Créditos:</b> 60	<b>Título:</b> Master (ECTS)	

### RAMA

Sciences

### PLAN

UNIVERSITY MASTER'S DEGREE IN MATERIALS SCIENCE

### TIPO DE ENSEÑANZA

Face-to-face

### CENTROS DONDE SE IMPARTE

Faculty of Science

### ESTUDIO IMPARTIDO CONJUNTAMENTE CON

Solo se imparte en esta universidad

### FECHAS DE EXAMEN

[Acceda al listado de fechas de examen para esta titulación.](#)

## PLAN DE ESTUDIOS OFERTADO EN EL CURSO 2021-22

Leyenda: No ofertada Sin docencia

### UNIVERSITY MASTER'S DEGREE IN MATERIALS SCIENCE

#### COMPULSORY SUBJECTS

33 créditos

Curso	Título	Créditos	Subject
1	END OF MASTER WORK	15	<a href="#">35838 - MASTER THESIS</a>
1	COMPULSORY	6	<a href="#">35800 - SOLID STATE CHEMISTRY</a>
1	COMPULSORY	6	<a href="#">35801 - SOLID STATE PHYSICS</a>
1	COMPULSORY	6	<a href="#">35805 - PHYSICAL CHEMISTRY OF SURFACES</a>

#### OPTIONAL SUBJECTS

27 créditos

Curso	Título	Créditos	Subject
1	OPTIONAL	6	<a href="#">35803 - CHARACTERISATION TECHNIQUES I: X-RAY SCATTERING, NEUTRON AND ELECTRON MICROSCOPY</a>
1	OPTIONAL	6	<a href="#">35804 - CHARACTERISATION TECHNIQUES II: SPECTROSCOPY AND SURFACE TECHNIQUES</a>
1	OPTIONAL	3	<a href="#">35807 - INTRODUCTION TO THE SCIENCE AND TECHNOLOGY OF CARBON MATERIALS</a>
1	OPTIONAL	3	<a href="#">35808 - APPLICATIONS OF CARBON MATERIALS</a>
1	OPTIONAL	3	<a href="#">35810 - FUNDAMENTALS OF ADSORPTION AND CATALYSIS</a>
1	OPTIONAL	3	<a href="#">35811 - HETEROGENEOUS CATALYSIS</a>
1	OPTIONAL	3	<a href="#">35812 - TRANSIENT TECHNIQUES APPLIED TO THE STUDY OF SOLID-GAS INTERACTIONS</a>
1	OPTIONAL	3	<a href="#">35813 - THERMAL ANALYSIS</a>
1	OPTIONAL	3	<a href="#">35816 - IN SITU VIBRATIONAL SPECTROSCOPY FOR THE CHARACTERISATION OF INTERFACES</a>
1	OPTIONAL	3	<a href="#">35817 - MAGNETIC AND SUPERCONDUCTOR MATERIALS: PHENOMENOLOGY AND FUNDAMENTALS</a>
1	OPTIONAL	3	<a href="#">35820 - SEMICONDUCTORS: FUNDAMENTALS AND DEVICES</a>
1	OPTIONAL	3	<a href="#">35821 - COMPOSITE MATERIALS</a>
1	OPTIONAL	3	<a href="#">35822 - CONDUCTIVE POLYMERS: FUNDAMENTALS AND APPLICATIONS</a>
1	OPTIONAL	3	<a href="#">35823 - MATERIALS FOR ENVIRONMENTAL AND ENERGY APPLICATIONS</a>
1	OPTIONAL	3	<a href="#">35824 - ANALYTICAL METHODS FOR POLYMERIC MATERIALS</a>
1	OPTIONAL	3	<a href="#">35826 - POLYMER SCIENCE</a>
1	OPTIONAL	3	<a href="#">35827 - SURFACE ELECTROCHEMISTRY</a>
1	OPTIONAL	3	<a href="#">35828 - ELECTROCHEMISTRY OF SEMICONDUCTOR MATERIALS</a>
1	OPTIONAL	3	<a href="#">35829 - ELECTROCATALYSIS, ELECTROCATALYTIC MATERIALS AND APPLICATIONS IN ELECTROCHEMISTRY</a>
1	OPTIONAL	3	<a href="#">35830 - CORROSION AND PROTECTION</a>
1	OPTIONAL	3	<a href="#">35831 - MODELLING IN MATERIALS SCIENCE: INTRODUCTION TO ATOMIC SIMULATION AND MONTE CARLO METHODS</a>
1	OPTIONAL	3	<a href="#">35833 - COMPUTATIONAL DETERMINATION OF MOLECULAR STRUCTURES</a>
1	OPTIONAL	3	<a href="#">35834 - INTRODUCTION TO DENSITY FUNCTIONAL THEORY</a>
1	OPTIONAL	3	<a href="#">35835 - NUMERICAL CALCULATION TECHNIQUES APPLIED TO PHYSICS AND CHEMISTRY</a>
1	OPTIONAL	3	<a href="#">35836 - NEW MATERIALS AND NANOMATERIALS IN CHEMICAL ANALYSIS</a>
1	OPTIONAL	3	<a href="#">35837 - ADHESION AND UNION PROCESSES OF MATERIALS</a>

Superado este bloque se obtiene

**MASTER'S DEGREE IN MATERIALS SCIENCE**

## OBJECTIVES

- To provide students with a postgraduate training which covers basic and applied aspects of Materials Science (including those identified as nanomaterials).
- To train doctors in the field of Materials Science who are equipped to conduct professional research activities, whether in the industrial or teaching sectors.
- To open up professional career paths for students, capitalising on the considerable collaboration that now exists between the University of Alicante and industry.
- To facilitate student contact with other universities and research centres active in the field of Materials Science.
- To consolidate and promote scientific and technical research in the field of the Science and Technology of Materials.



- [Structure of the Master's Degree: credits and subjects](#)
- [Distribution of subjects by year/semester](#)
- [General Syllabus Planning](#)

**MASTER'S DEGREE: CREDITS AND SUBJECTS**

Subject type	Credits
Compulsory (OB)	18
Optional (OP)	27
Master's Final Project (OB)	15
<b>TOTAL CREDITS</b>	<b>60</b>

**DISTRIBUTION OF SUBJECTS BY YEAR/SEMESTER**

FIRST SEMESTER 18 ECTS 18 COMPULSORY ECTS			
SUBJECT AREAS (CORE MODULE)	SUBJECTS	TYPE	ECTS
SOLID STATE	SOLID STATE CHEMISTRY	OB	6
	SOLID STATE PHYSICS	OB	6
SURFACE CHEMICAL PHYSICS	SURFACE CHEMICAL PHYSICS	OB	6

SECOND SEMESTER (30 ECTS) 27 OPTIONAL ECTS + 15 COMPULSORY ECTS CORRESPONDING TO THE MASTER'S FINAL PROJECT			
SUBJECT AREA (CORE MODULE)	SUBJECTS	TYPE	ECTS
CHARACTERISATION TECHNIQUES	CHARACTERISATION TECHNIQUES I: X-RAY SCATTERING, NEUTRON AND ELECTRON MICROSCOPY	OP	6
	CHARACTERISATION TECHNIQUES II: SPECTROSCOPY AND SURFACE TECHNIQUES	OP	6
SUBJECT AREAS (SPECIALISATION MODULE)	SUBJECTS	TYPE	ECTS
CARBON MATERIALS	INTRODUCTION TO THE SCIENCE AND TECHNOLOGY OF CARBON MATERIALS	OP	3
	APPLICATIONS OF CARBON MATERIALS	OP	3
	BASICS OF ADSORPTION AND CATALYSIS	OP	3
	HETEROGENEOUS CATALYSIS	OP	3
	PHASE-TRANSITION TECHNIQUES APPLIED TO THE STUDY OF SOLID-GAS INTERACTIONS	OP	3
	THERMAL ANALYSIS	OP	3
HETEROGENEOUS CATALYSIS AND POROUS SOLIDS	BASICS OF ADSORPTION AND CATALYSIS	OP	3
	HETEROGENEOUS CATALYSIS	OP	3
	PHASE-TRANSITION TECHNIQUES APPLIED TO THE STUDY OF SOLID-GAS INTERACTIONS	OP	3
	THERMAL ANALYSIS	OP	3
	IN SITU VIBRATIONAL SPECTROSCOPY FOR CHARACTERISING INTERFACES	OP	3

FUNCTIONAL AND STRUCTURAL MATERIALS	MAGNETIC AND SUPERCONDUCTOR MATERIALS: PHENOMENOLOGY AND FUNDAMENTALS	OP	3
	NEW MATERIALS And NANOMATERIALS IN CHEMICAL ANALYSIS	OP	3
	SEMICONDUCTORS: BASICS AND DEVICES	OP	3
	COMPOSITE MATERIALS	OP	3
	CONDUCTIVE POLYMERS: BASICS AND APPLICATIONS	OP	3
	MATERIALS FOR ENVIRONMENTAL AND ENERGY APPLICATIONS	OP	3
	ANALYTICAL METHODS FOR POLYMERIC MATERIALS	OP	3
	POLYMER SCIENCE	OP	3
ELECTROCHEMICAL MATERIALS	SURFACE ELECTROCHEMISTRY	OP	3
	ELECTROCHEMISTRY OF SEMICONDUCTOR MATERIALS	OP	3
	ELECTROCATALYSIS, ELECTROCATALYTIC MATERIALS AND APPLICATIONS IN ELECTROCHEMISTRY	OP	3
	IN SITU VIBRATIONAL SPECTROSCOPY FOR CHARACTERISING INTERFACES	OP	3
	CORROSION AND PROTECTION	OP	3
	CONDUCTIVE POLYMERS: BASICS AND APPLICATIONS	OP	3
	MATERIALS FOR ENVIRONMENTAL AND ENERGY APPLICATIONS	OP	3
SIMULATION AND COMPUTING IN MATERIALS SCIENCE	MODELLING IN MATERIALS SCIENCE: INTRODUCTION TO ATOMIC SIMULATION AND MONTE CARLO METHODS	OP	3
	COMPUTATIONAL METHODS FOR CALCULATING MOLECULAR STRUCTURE	OP	3
	INTRODUCTION TO DENSITY FUNCTIONAL THEORY	OP	3
	NUMERICAL TECHNIQUES APPLIED TO PHYSICS AND CHEMISTRY	OP	3
POLYMERIC MATERIALS	POLYMER SCIENCE	OP	3
	ANALYTICAL METHODS FOR POLYMERIC MATERIALS	OP	3
	CONDUCTIVE POLYMERS: BASICS AND APPLICATIONS	OP	3
	ADHESION And PROCESSES OF UNION OF MATERIALS	OP	3
ENVIRONMENT AND ENERGY	NEW MATERIALS And NANOMATERIALS IN CHEMICAL ANALYSIS	OP	3
	APPLICATIONS OF CARBON MATERIALS	OP	3
	BASICS OF ADSORPTION AND CATALYSIS	OP	3
	CONDUCTIVE POLYMERS: BASICS AND APPLICATIONS	OP	3
	MATERIALS FOR ENVIRONMENTAL AND ENERGY APPLICATIONS	OP	3
	HETEROGENEOUS CATALYSIS	OP	3
FINAL PROJECT		OB	15

## GENERAL COURSE PROGRAMME

Teaching on the Master's Degree in Materials Science is structured as follows:

- Core Module
- Specialisation Module
- Master's Final Project

Compulsory subjects on the Master's Degree, worth 18 ECTS credits, are taught as part of the core module. Optional subjects, worth 27 ECTS credits, are taught as part both of the core module and the specialisation module.

It should be noted that the core module consists of subject areas which are fundamental to the field of Materials science.

The core module contains subjects worth 6 ECTS credits (5 theoretical subjects and 1 practical subject).

The specialisation module contains 7 subjects areas related to the areas of research of interest to those involved in teaching on the Master's Degree. These subject areas are:

- Carbon materials
- Heterogeneous catalysis
- Functional and structural materials
- Electrochemical materials
- Simulation and computing in Materials Science
- Polymeric materials
- Environment and energy

Each of these subject areas contains various optional subjects, worth 3 ECTS credits. It should be noted that some subjects are common to various subject areas. Students are required to take at least 3 subjects from the same subject area.

The Master's Degree programme concludes with the Master's Final Project (MFP). This comprises supervised work where students are required to address problems using a practical and applied approach which will equip them to carry out further research in one of the areas of interest to those teaching on the Master's Degree course. The Master's Final Project will also enable students to apply the knowledge they have acquired during study of the previous modules.

- [Entry Requirements](#)
- [Admission and Assessment Criteria](#)
- [Pre-enrolment and Enrolment](#)
- [Number of Places](#)

## ENTRY REQUIREMENTS

According to the Regulations of the University of Alicante, the following requirements must be complied to have access to official taught Master's degrees:

1. To be in possession of a SPANISH OFFICIAL GRADUATE DEGREE CERTIFICATE or other issued by an institution of higher education within the [EHEA](#) (European Higher Education) that enables the holder to have access to Master's degrees in the issuing .
2. To be in possession of an officially approved FOREIGN HIGHER EDUCATION DEGREE CERTIFICATE that had been recognised as equal to the degree that allows access to the requested studies.
3. To be in possession of a UNIVERSITY DEGREE CERTIFICATE obtained in a University or Higher Education Institution of COUNTRIES OUTSIDE THE EHEA, without the prior approval of their studies. In this case, the following should be considered:
  - Non- recognised degree certificates shall require a technical report showing an equivalence statement issued by the University of Alicante ([ContinUA – Continuing Education Centre](#)), for which the [corresponding fee](#) should be paid.
  - Access through this way does under no circumstances imply prior official approval of the holder's degree certificate, nor its recognition for purposes other than studying a master's degree.

## ADMISSION AND ASSESSMENT CRITERIA

### 1.- Admission profile

To be considered for admission to the Master's Degree in Materials Science at the University of Alicante, applicants should hold one of the following:

1. An officially recognised Spanish Degree in Chemistry, Chemical Engineering or a related field.
2. A Degree or Engineering qualification in Chemistry, Chemical Engineering or related areas, obtained according to the course programmes in existence prior to the enactment of RD 1393/2007.
3. An official university qualification issued by a higher education institution forming part of the European Space for Higher Education, equivalent to the qualifications indicated in points 1 and 2 above, and which qualifies the holder for admittance to a Master's Degree in the issuing country.
4. A non-homologated qualification from abroad, accrediting a level of training equivalent to the corresponding official Spanish university qualifications indicated in points 1 and 2 above, and which qualifies the holder for admittance to a Master's Degree in the issuing country.

The weighting of the criteria for admission to the event that demand exceeds supply are as follows: 90% Certification and record in Chemistry, Physics, Chemical Engineering and Materials Engineering, and related areas to be defined by the Academic Committee and 10 % other merits (English, collaborative scholarship, research collaborations, etc..).

## PRE-ENROLMENT AND ENROLMENT

### PRE-ENROLMENT [+info](#)

Students who wish to study for an Officially Recognised Master's Degree at the UA should complete pre-enrolment in accordance with the deadlines and conditions specified annually.

### ENROLMENT [+info](#)

Following publication of the definitive list of those admitted to the course, an email containing the user password will be sent to the students, enabling them to enrol via the **Campus Virtual** in accordance with the deadlines and conditions specified annually.

In the registration process, the **documents issued abroad** must be official, duly notarised and translated. Further information:

- <http://sga.ua.es/en/academic-regulations/legalizacion/legalization-of-documents.html>

## NUMBER OF PLACES

COURSE	NUMBER OF PLACES
2012-13	20



2013-14	20
2014-15	20
2015-16	20
2016-17	20

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**FOCUS**

Research.

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**DEGREE COURSE SPECIALISATION PROFILE**

Introduction to research in Materials Science.

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**PROFESSIONAL PROFILE****Professions for which the degree qualifies its holder**

Given that the Master's Degree in Materials Science focuses on research, it is not aimed specifically at any given professions. However, in addition to providing the background necessary for undertaking the research activity to prepare a doctoral thesis, the training students will receive on this Master's course will equip them to undertake R&D activities in technology centres and businesses devoted to the field of Materials Science. Furthermore, this training provides an advanced and specialised education in an extremely important area, both from a fundamental perspective and in its industrial applications. It should also be highlighted that the study of Materials Science has an outstanding future in scientific and applied fields, including new areas of research in nanomaterials.

**TIMESCALE FOR IMPLEMENTATION****1. Timescale for implementation of the new Master's degree**

Academic year	Implementation of the Master's Degree
2010-2011	Master's Degree, 60 ECTS

The Master's Degree is a one year full-time programme. The course will have been fully implemented by the 2010-2011 academic year.

**2. Procedure for equivalence recognition, where appropriate, between the current and the new course programme.**

Not applicable.

**3. 3. Studies that will be discontinued and replaced by the proposed Degree course:**

The Materials Science doctorate programme will be discontinued.

- [Verified Report](#)
- [Resolution from the Universities Council: Positive verification](#)
- [Resolution from the Universities Council: Accreditation renewal](#)
- [Authorization from the Valencian Government](#)

#### Internal Quality Assurance System (SGIC) of the Title

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- Structure of the Centre for Quality
  - [Comission of Internal Quality Guarantee](#)
  - [Other Commissions](#)
- [Handbook SGIC](#)
- [Procedures](#)
  - [Strategic \(PE\)](#)
  - [Key \(PC\)](#)
  - [Support \(PA\)](#)
  - [Measurement \(PM\)](#)
- [Management of the SGIC \(Access to ASTUA\)](#)

#### Follow-up of the Title

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- [Self-reports UA](#)
- [External reports AVAP](#)
- [Other reports](#)
- [Improvement Plans](#)
- [Progress and Learning Outcomes](#)

Information about the Centre	General information for students
<ul style="list-style-type: none"> <li>• <b>Faculty of Sciences</b></li> </ul> <p>Campus de San Vicente del Raspeig Ctra. de Alicante s/n 03690 San Vicente del Raspeig (Alicante) Telephone:+ 34 96 590 3557 Fax:+ 34 96 590 3781 <a href="mailto:facu.ciencias@ua.es">facu.ciencias@ua.es</a> <a href="http://ciencias.ua.es/en/">http://ciencias.ua.es/en/</a></p> <ul style="list-style-type: none"> <li>• <b>Life Long Learning Centre (ContinUA)</b></li> </ul> <p><b>Only for pre-enrolment formalities</b></p> <p>Germán Bernácer Building. Ground Floor Telephone: + 34 96 590 9422 Fax: + 34 96 590 9442 <a href="mailto:continua@ua.es">continua@ua.es</a> <a href="https://web.ua.es/en/continua/">https://web.ua.es/en/continua/</a></p>	<ul style="list-style-type: none"> <li>• <a href="#">Grants and assistance</a></li> <li>• <a href="#">Accommodation</a></li> <li>• <a href="#">Student refectories and cafeterias</a></li> <li>• <a href="#">Transport</a></li> <li>• <a href="#">Emergency medical care</a></li> <li>• <a href="#">Insurance</a></li> <li>• <a href="#">Services for students with special needs</a></li> <li>• <a href="#">Student representation and participation</a></li> <li>• <a href="#">University student identity card (TIU)</a></li> <li>• <a href="#">Frequently asked questions</a></li> </ul>
UA: General Regulations	+ Information about qualifications
<ul style="list-style-type: none"> <li>• <a href="#">Academic regulations and procedures of the University of Alicante</a></li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Official State Gazette (BOE) on publication of course programmes Modification</a></li> <li>• <a href="#">Own Web</a></li> <li>• <a href="#">Information pamphlet</a></li> <li>• <a href="#">Details title on the RUCT</a></li> </ul>