Información del máster

El idioma oficial del Máster será el inglés.

Obligatorias: 20 ECTS
Optativas: 20 ECTS
Trabajo Fin de Máster: 20 ECTS

Tres módulos trimestrales de 20 créditos ECTS cada uno:

Durante el primer trimestre del curso (octubre, noviembre y diciembre), se impartirá en la Universidad Autónoma de Madrid un módulo general (M1) de asignaturas obligatorias para todos los estudiantes matriculados en el máster. Este módulo dará al estudiante una visión global y variada de los principales campos de estudio e interés dentro del área de la física de la materia condensada, y proporcionará un mínimo de conocimientos de carácter teórico, experimental y computacional para todos los estudiantes de esta disciplina. Además, este módulo servirá en gran medida para "nivelar" a estudiantes que provengan de distintos sistemas educativos y planes de estudios.

El segundo módulo del plan de estudios (M2) lo compone una variada oferta de asignaturas optativas que cubre la mayor parte de los temas de investigación avanzada en la física de la materia condensada y en las nanotecnologías físicas, tanto aspectos experimentales como teóricos o desde enfoques de física computacional. Este módulo de formación más avanzada y práctica se impartirá durante el segundo trimestre (de enero a marzo). Se ofertarán distintos bloques de asignaturas optativas en cada una de las 3 sedes del programa (Universidad Autónoma de Madrid, Universidad de Oviedo y Universidad de Murcia).

Finalmente, durante el tercer trimestre (M3), los estudiantes realizarán obligatoriamente su Trabajo de Fin de Máster, bajo la supervisión de un profesor del programa de posgrado de la universidad en que se haya matriculado. La elección del Trabajo de Fin de Máster la realizará cada estudiante durante el primer trimestre del máster, de acuerdo con el tutor solicitado o asignado. Al concluir este trimestre, se celebrará un acto público donde los estudiantes que opten al título de máster defenderán delante de un tribunal de 4 miembros (uno por departamento) los trabajos de iniciación a la investigación realizados.

Plan de estudios

Código	Asignatura	Semestre	Carácter	ECTS	Módulo
30594	Física estadística avanzada	1 (UAM)	Obligatoria	4	M1
30595	Física de bajas temperaturas: Superconductividad y superfluidez	1 (UAM)	Obligatoria	4	M1
30596	Física de superficies e interfases	1 (UAM)	Obligatoria	4	M1
30597	Física de materiales	1 (UAM)	Obligatoria	4	M1
30598	Cálculo numérico y computacional	1 (UAM)	Obligatoria	4	M1
30599	Introducción a la Nanotecnología I	2 (UAM)	Optativa	4	M2
30600	Física estadística de líquidos y sistemas complejos	2 (UAM)	Optativa	4	M2
30601	Física de vidrios y sólidos no cristalinos	2 (UAM)	Optativa	4	M2

Código	Asignatura	Semestre	Carácter	ECTS	Módulo
30602	Métodos computacionales en física de la materia condensada	2 (UAM)	Optativa	4	M2
30603	Teoría cuántica avanzada en física de la materia condensada	2 (UAM)	Optativa	4	M2
30604	Instrumentación científica y control	2 (UAM)	Optativa	4	M2
30605	Física avanzada de bajas temperaturas	2 (UAM)	Optativa	4	IM2
30606	Física avanzada de superficies: Auto-ensamblaje y auto-organización	2 (UAM)	Optativa	4	M2
30607	Propiedades electrónicas, magnéticas y de transporte en sistemas de baja dimensionalidad y nanoestructuras	2 (UAM)	Optativa	4	M2
30608	Nanofotónica	2 (UAM)	Optativa	4	M2
30609	Nanoestructuración de materiales funcionales	2 (UAM)	Optativa	4	M2
31893	Magnetismo de sólidos	2 (UOV)	Optativa	5	M2
31894	Fabricación y caracterización de nanoestructuras	2 (UOV)	Optativa	5	M2
31895	Simulación de materiales y nanoestructuras magnéticas	2 (UOV)	Optativa	5	M2
31896	Teoría y práctica de la superconductividad	2 (UOV)	Optativa	5	M2
30615	Simulación y métodos computacionales de física estadística	2 (UMU)	Optativa	4	M2
30616	Introducción a la programación en paralelo	2 (UMU)	Optativa	4	M2
31898	Introducción a la Nanotecnología II	2 (UMU)	Optativa	4	M2
30614	Mojado de superficies y efectos de capilaridad	2 (UMU)	Optativa	4	M2
31897	Teoría de campos aplicada a la Materia Condensada	2 (UMU)	Optativa	4	M2
30619	Trabajo de Fin de Máster	2 (UAM, UOV UMU)	TFM	20	M3

English Version - Course 2012/2013

Master in Condensed Matter Physics and Nanotechnology

Inter-university

Universidad Autónoma de Madrid, Universidad de Murcia and Universidad de Oviedo

Master's degree information

Mandatory: 20 ECTS
Elective: 20 ECTS
Master's Thesis: 20 ECTS

The official language for the master course is ENGLISH

Three quarterly modules of 20 ECTS credits each:

During the first quarter of the course (October, November and December), a general module (M1) of compulsory subjects shall be taught in the Universidad Autónoma de Madrid for all students matriculated in the master's degree. This module will give students a varied overview of the main fields of study and interest within the area of condensed matter physics, and will provide a minimum of theoretical, experimental and computational knowledge for all students of this discipline. This module will also largely serve to “level out” students from different educational systems and curricula.

The second curriculum module (M2) includes a varied range of optional subjects which covers most of the advanced research areas in condensed matter physics and in physical nanotechnologies, both experimental and theoretical aspects or from computational physics approaches. This more advanced and practical training module will be given during the second quarter (from January to March). Different blocks of optional subjects will be offered in each of the 3 programme venues (Universidad Autónoma de Madrid, University of Oviedo and University of Murcia).

Finally, during the third quarter (M3), students must carry out their Master's Thesis, under the supervision of the postgraduate programme of the university in which they are matriculated. The Master's Thesis will be chosen by each student during the first term of the master's degree, in accordance with the requested or assigned tutor. At the end of this quarter a public act will be held where students eligible for the master's degree will defend the introduction to research works performed before a panel of 4 members (one per department).

Curriculum

COURSES IN FIRST MODULE. Location: UAM (October-December)

Code	Course	Type	Credits	Trimester
30594	Advanced statistical physics	Compulsory	4	1
30595	Low temperature physics: superconductivity and superfluidity	Compulsory	4	1
30596	Physics of surfaces and interfaces	Compulsory	4	1
30597	Materials Science	Compulsory	4	1
30598	Computational and numerical analysis	Compulsory	4	1

COURSES IN SECOND MODULE (M2). Location: UAM (January-March)*

Code	Course	Type	Credits	Trimester
30599	Introduction to Nanotechnology	Elective	4	2
30600	Statistical Physics of Liquids and Complex Systems	Elective	4	2
30601	Physics of Glasses and Non-Crystalline Solids	Elective	4	2
30602	Computational Methods in Condensed Matter Physics	Elective	4	2
30603	Advanced quantum theory in condensed matter	Elective	4	2
30604	Scientific instrumentation and control	Elective	4	2
30605	Advanced low-temperature physics	Elective	4	2
30606	Advanced Surface Physics: Self-Assembly & Self-organization	Elective	4	2
30607	Electronic, magnetic and transport properties of low dimensional systems and nanostructures	Elective	4	2
30608	Nanophotonics	Elective	4	2
30609	Nanostructuration of functional materials	Elective	4	2

COURSES IN SECOND MODULE (M2). Location: UOV (January-March)*

Code	Course	Type	Credits	Trimester
31893	Magnetism of solids	Elective	5	2
31894	Fabrication and characterization of nanostructures	Elective	5	2
31895	Simulation of materials and magnetic nanostructures	Elective	5	2
31896	Theory and applications of superconductivity	Elective	5	2

COURSES IN SECOND MODULE (M2). Location: UMU (January-March) *

Code	Course	Type	Credits	Trimester
30615	Simulation and computational methods of statistical physics	Elective	4	2
30616	Introduction to parallel programming	Elective	4	2
31898	Introduction to Nanotechnology II	Elective	4	2
30614	Wetting of surfaces and capillary effects	Elective	4	2
31897	Field theory applied to Condensed Matter	Elective	4	2

*A minimum of three students are required

COURSES IN THIRD MODULE (M3) (April-June)

Code	Course	Type	Credits	Trimester	Location
30619	Master thesis	Compulsory	20	3	UAM,UOV,UM

Entry and admission requirements

The general student access and admission conditions for all master's degrees are essentially the same in the three co-participating universities.

To access the Universidad Autónoma de Madrid (UAM) master's degree you will need an official Spanish university degree. University graduates can also access from foreign educational systems without the need to gain recognition of their degrees, provided that they certify an educational level equivalent to those corresponding to official Spanish university degrees and that they would allow access to postgraduate education in the country issuing the degree.

These conditions are evidently the same for all students, irrespective of the university they are matriculated in.
In first place, it specifically requires having obtained a bachelor's degree or EHEA degree in Physics (or related studies), with basic training in Quantum Physics, Statistical Mechanics and Solid State Physics.
Students must also certify a level of knowledge of English B1 or equivalent, which means they are capable of reading, understanding and writing scientific texts in English, as well as being able to understand a seminar given in English.

Normally, the number of students that meet all admission requirements and request matriculation in this master's degree is less than the maximum number of places offered. If the number should be higher, the main criteria for assessing merits and student selection shall be: your previous student record; studies in Physics before those in other disciplines; knowledge of English and Spanish; their interest in undertaking a research career in the area; and personal interview if necessary.

Documents and specific Requirements for Admission

Compulsory

Subjects pre-selection Form
Official certificate OR letter signed by the student, specifying the level of English language
A personal interview may be asked.