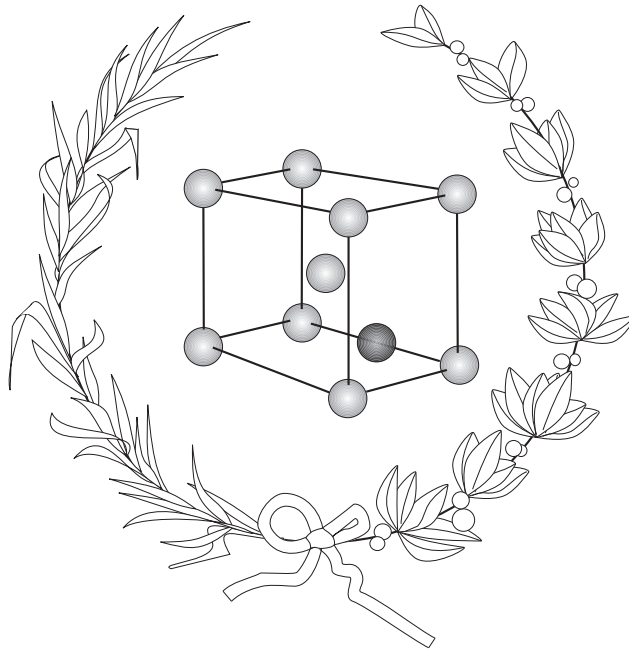




POLITÉCNICA



**DEGREE IN
MATERIALS ENGINEERING
UPM**

GUIDE FOR FOREIGN STUDENTS

**ACADEMIC YEAR
2011 – 2012**

**GUIDE
ACADEMIC YEAR**

2011 - 2012



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I. STUDYING MATERIALS ENGINEERING AT THE UPM

I.1. INTRODUCTION

► The University

The UPM is the largest and most important Technical University in Spain, with more than 40,000 undergraduate students and 8,000 graduate students.

The UPM (Technical University of Madrid) became a university as such in 1971, although most of its Centers date from centuries before, having been founded in the 18th and 19th centuries. Each Center maintained an independent existence until they were merged to form the UPM. It is no exaggeration to say that a large part of the history of Spanish technology in the last 150 years has been written by the Schools of Architecture and Engineering of the UPM, as for many years these were practically the only schools of their kind. All of the major Spanish figures in teaching and research spent time at the respective UPM Centers as students or lecturers.



www.upm.es/internacional/Students | Tel.: 91 336 67 27

Vicerrectorado de Alumnos (Vice-Rector's Office for Student Affairs)

-Servicio de Atención al Alumno y Extensión Universitaria (Student Services and University Extension)

-Movilidad de Estudiantes (Student Mobility).

-Erasmus Program: Spanish and Foreign Students.

Paseo Juan XXIII, 11

28040-Madrid

Tel: 91 3367986/91 3366018

Fax: 91 3367980

E-mail: erasmus@upm.es

Office open from Monday to Friday from 9.00 am to 2.00 pm



► Degree in Materials Engineering

The goal of these studies is to train engineers by giving them an interdisciplinary technical background, enabling them to carry out numerous activities associated with materials in a wide range of production sectors such as product design and the selection, extraction, development and processing of materials, including computer modeling and application of criteria for service life and quality and production control. Graduates will be able to conduct research and execute projects associated with manufacture, processing and use of materials, as well as recycling, environmental impact and control, restoration and renovation.

The training process, which follows a quality model and is taught by specialist lecturers, includes a system of individualized tutorials and personal attention to students. The third year is taught entirely in English and also includes in-company work experience and time spent at study centers abroad.

The degree is fully in line with the spirit of the European Higher Education Area and meets the growing demand for qualifications of this type both within Spain and abroad. It is also a leading degree in subjects such as Nanotechnology, Biomaterials and Numerical Simulation. For some decades, Materials Science and Engineering has come to acquire a prominent position due to the strategic importance of the materials sector and the constant, overwhelming development that has occurred in the manufacture of new materials. The preeminent role of new technological areas such as nanotechnology and bioengineering has reinforced the distinctive, unique nature of Materials Engineering in relation to other engineering disciplines that have evolved from the forerunners of the 19th century.

Specializations: Students may choose from three itineraries: Structural Materials (materials for energy or aeronautics), Functional Materials (nanomaterials, materials for optoelectronics) and Materials for Life Sciences (biomaterials, tissue engineering).



www.materiales.upm.es | Tel.: 91 336 67 27

Higher Technical School of Civil Engineering.

Campus Ciudad Universitaria. Profesor Aranguren 3.

28040 Madrid

I.2. FORMALITIES REQUIRED ON COMPLETING YOUR STUDIES

On completing your studies you will need to go through the following formalities before returning home:

- ▶ Request the following documents from the Erasmus Coordinator of the UPM Center where you have studied:
 - ▶ Attendance Certificate stating the period of studies at the UPM.
 - ▶ Transcript of Records.

You will need to provide the originals of these documents at your home university or center of study. Within ten days of completing your studies you will need to **provide the following** to the Student Services and University Extension Office (UPM Rector's Office - Edificio B; Paseo Juan XXIII, 11- Madrid):

- ▶ Photocopies of the aforementioned documents.
- ▶ Survey or report on your time at the UPM.

If the Transcript of Records is not available when you leave, the office in charge of the Exchange Program at the Center where you have studied will forward it to your home address or to your home university or center of study and will also send a photocopy to the Student Services and University Extension Office.



I.3. CONTACT INFORMATION

SCHOOL OF CIVIL ENGINEERING

Director (Dean): Dr. Juan Santamera

Deputy Director for International Relationship: Dr. Luis Garrote

Phone number: +34 91 336 67 64

Email: internacional@caminos.upm.es

Executive Assistant to the Director of the School of Civil Engineering for the Degree of Materials Engineering: Dr. José Miguel Atienza

Phone number: +34 91 336 52 39

Email: jmatienza@mater.upm.es

DEGREE OF MATERIALS ENGINEERING:

Coordinator: Dr. Manuel Elices

Secretary: Ms. Rosa María Morera

Phone number: 91 336 66 79

Fax: 91 543 78 45

Materials Engineering Secretary: Ms. Ana María Flores

Phone number: 91 336 67 54

Fax: 91 336 66 80

Email: materiales@mater.upm.es

Representative of Students : Mr. Eduardo de Nicolás

Departamento de Ciencia de Materiales

E.T.S.Ingenieros de Caminos, Canales y Puertos

Ciudad Universitaria

28040 Madrid, SPAIN

I.4. DEGREE CONTENTS

Degree in Materials Engineering at the Technical University of Madrid STRUCTURE						
Year	Semester	Subjects	Contents	Cl.	ECTS	Coordinator
1 ^o	1 ^o	MECÁNICA	Kinematics and Dynamics of Material Points and Rigid Bodies.	CO	6	Vicente Sánchez Gálvez
		MATEMÁTICAS I	Algebra, Geometry, Calculus	CO	6	Dionisio Pérez Esteban
		FUNDAMENTOS QUÍMICOS	Inorganic chemistry, Organic chemistry, Biochemistry	CO	6	José Ramón Tapia Merino
		ESTRUCTURA DE MATERIALES I	Crystalline materials, Phase Transformations, Diffraction, Microscopy	CO	6	Nuria Martín Piris
		ELECTRICIDAD Y MAGNETISMO	Electricity, Magnetism, Waves	CO	6	Gustavo Plaza Baonza
	2 ^o	TERMODINÁMICA	Statistical Mechanics, Heat Transportation, Thermodynamics	CO	6	Jaime Planas Roselló
		MATEMÁTICAS II	Differential Equations, Statistics	CO	6	Guillermo Reyes Souto
		MATERIALES METÁLICOS I	Structure, Properties, Manufacturing, Processing	CO	6	José Manuel Ruiz Román
		ESTRUCTURA DE MATERIALES II	Amorphous Materials, Biological Materials, Characterization, Microscopy	CO	6	José Ygnacio Pastor Caño
		BIOLOGÍA	Molecular and Cell Biology. Physiology, Biomechanics	CO	6	Pilar Pita Andréu

Cl.: Classification. CO: Compulsory subject. OP: Optional subject



Degree in Materials Engineering at the Technical University of Madrid | STRUCTURE (CONT.)

Year	Semester	Subjects	Contents	Cl.	ECTS	Coordinator
2°	3°	MECÁNICA DE MATERIALES I	Mechanics of Solids and Fluids, Time-dependent behavior	CO	6	Jaime Planas Roselló
		FÍSICA CUÁNTICA	Quantum Mechanics, Atoms, Molecules, Solids, Particles, Statistical Physics	CO	6	Juan Carlos Suárez Bermejo
		MATERIALES CERÁMICOS	Structure, Properties, Manufacturing, Processing	CO	6	Luis García Cambronero
		MATERIALES POLÍMEROS	Structure, Properties, Manufacturing, Processing	CO	6	Victoria Alcázar Montero
		QUÍMICA DE SUPERFICIES	Kinematics and Mechanisms, Corrosion, Degradation, Protection	CO	6	José Ramón Ibars Almonacil
	4°	MECÁNICA DE MATERIALES II	Strength of Materials, Elasticity	CO	5	Carlos González Martínez
		PROPIEDADES DE MATERIALES I	Electrical Properties, Optical properties	CO	5	Adrián Hierro Cano
		MATERIALES BLANDOS	Fluids, Gels, Membranes	CO	5	Gustavo Plaza Baonza
		INSTRUMENTACIÓN	Amplifiers, Sensors, Filtering, Control	CO	5	Francisco Gálvez Díaz-Rubio
		ORGANIZACIÓN EMPRESARIAL	Economy, Production Systems, Programming, Simulation	CO	6	Vicente Sánchez Gálvez
		MATERIALES METÁLICOS II	Aluminum Alloys, Titanium Alloys, Other Lightweight Alloys	CO	4	Juan Manuel Antoranz Pérez

Cl.: Classification. CO: Compulsory subject. OP: Optional subject

Degree in Materials Engineering at the Technical University of Madrid | STRUCTURE (CONT.)

Year	Semester	Subjects	Contents	Cl.	ECTS	Coordinator
3°	5°	MECHANICS OF MATERIALS III	Plasticity, Viscoplasticity	CO	6	Francisco Gálvez Díaz-Rubio
		PROPERTIES OF MATERIALS II	Magnetic Properties, Thermal Properties	CO	6	José Luis Prieto
		COMPOSITE MATERIALS	Classification, Manufacturing, Macro/Micromechanics, In-service behavior	CO	6	Javier Llorca Martínez
		SIMULATION	Numerical methods, Data treatment, CAD	CO	6	Javier Segurado Escudero
		OBTAINING OF MATERIALS	Extractive Metallurgy. Siderurgy. Obtaining of Nonmetallic Materials	OP	6	José Manuel Fidalgo Alonso
	WORKSHOP ON FUNCTIONAL MATERIALS: STRUCTURE	Semiconductors characterization: Profilometry, SEM, AFM, X-Rays.	OP	6	Jesús Sangrador / José M ^a Ulloa	
	BIOMIMETICS	Self-assembly, Hierarchically Organized Materials, Intelligent Materials, Biosensors	OP	6	José Pérez Rigueiro	
	ENGLISH	Oral and written communication.	OP	6	Silvia Molina Plaza	
	6°	MECHANICS OF MATERIALS IV	Fracture, Fatigue, Creep, Structural Integrity	CO	6	José Miguel Atienza Riera
		NANOTECHNOLOGY	Structures, Manufacturing, Characterization	CO		Fernando Calle Gómez
SURFACE ENGINEERING		Semiconductors, Epitaxial growth, Doping, Characterization	CO	6	Enrique Calleja Pardo	
RECYCLING OF MATERIALS		Recycling, Recovering, Inactivation	CO		José Manuel Fidalgo Alonso	
QUALITY AND QUALITY MANAGEMENT		Components, Systems and Processes, Projects, Standardization, Certification	CO		Jorge de Esteban Ortega	

Cl.: Classification. CO: Compulsory subject. OP: Optional subject



Degree in Materials Engineering at the Technical University of Madrid | STRUCTURE (CONT.)

Year	Semester	Subjects	Contents	CI.	ECTS
4°	7°	MATERIALES ESTRUCTURALES I	Materials for Transportation, Building Materials, Obtaining and Processing	CO	5
		MATERIALES FUNCIONALES I	Materials for Energy and Communications. Obtaining and Processing	CO	5
		BIOMATERIALES I	Materials for Diagnosing, Materials for Medical Treatments. Obtaining and Processing	CO	5
		PROCESOS DE CONFORMADO	Casting of metallic and nonmetallic materials. Shaping through deformation. Sintering	OP	5
		TÉCNICAS DE UNIÓN	Welding and brazing in metallic and nonmetallic materials. Adhesive joining. Mechanical joining	OP	4
		MATERIALES AVANZADOS PARA MICROELECTRÓNICA	Diodes, Transistors, Filters, MEMS, Magnetic Sensors	OP	5
		LABORATORIO DE MATERIALES FUNCIONALES: ELÉCTRICO	Characterization of Semiconductors: Hall, impedance (I-V, C-V), RF; Response of Microelectronic Devices	OP	4
		BIOMECÁNICA	Biomechanics of the musculoskeletal system, Biomechanics of soft tissues, Biomechanics of fluids	OP	5
		INGENIERÍA DE TEJIDOS	Cells, Cell Signaling, Matrices, Applications	OP	4
		LABORATORIO DE MATERIALES BIOLÓGICOS Y BIOMATERIALES	Characterization, Structural Tests, Local Tests, In-Vitro Tests, In-Vivo Tests	OP	4

CI.: Classification. CO: Compulsory subject. OP: Optional subject

Degree in Materials Engineering at the Technical University of Madrid | STRUCTURE (CONT.)

Year	Semester	Subjects	Contents	CI.	ECTS	
4 ^o	8 ^o	MATERIALES ESTRUCTURALES II	Materials for Transportation, Building Materials, Design and Applications	CO	5	
		MATERIALES FUNCIONALES II	Materials for Energy and Communications .Design and Applications	CO	6	
		BIOMATERIALES II	Materials for Diagnosing, Materials for Medical Treatments. Design and Applications	CO	5	
		ANÁLISIS Y ENSAYOS DE MATERIALES	Techniques of Instrumental Analysis. Defects in Materials. Nondestructive Testing	OP	5	
		MATERIALES METÁLICOS III	Copper Alloys. High-Temperature Alloys. Other Metallic Alloys	OP	4	
		MATERIALES DE CONSTRUCCIÓN	Concrete and Mortar, Metallic Materials, Composite Materials, Bituminous Materials, Stone, Wood	OP	4	
		MATERIALES AVANZADOS PARA OPTOELECTRÓNICA	Detectors, LEDs, Lasers, Waveguides, Solar Cells	OP	5	
		LABORATORIO DE MATERIALES FUNCIONALES: ÓPTICO	Characterization of Semiconductors: Absorption, PL, PR, Ellipsometry; Response of Optical and Optoelectronic Devices	OP	4	
		BIOSENSORES	Biofunctionalization, Micro-fluidics, Micro- and Nanostructures, Applications	OP	5	
		INGENIERÍA DEL MATERIAL CELULAR	Cell Membrane, Cytoskeleton, Ribosomes, Mitochondria, Chloroplasts	OP	4	
	YEAR	PRACTICAS EXTERNAS			OP	≤ 24
		ESTANCIA EN CENTROS EXTRANJEROS			OP	12 or 30
		PROYECTO FIN DE GRADO			CO	12



Itineraries

Each block defines an itinerary in which students have to choose five subjects accounting for a total of 24 ECTS credits.

The three blocks of optional subjects are shown below:

Degree in Materials Engineering at the UPM		
Optional subjects for Itinerary A) STRUCTURAL MATERIALS		
Subject	Contents	ECTS Credits
OBTAINING OF MATERIALS	Extractive Metallurgy. Siderurgy. Obtaining of Nonmetallic Materials	6
PROCESOS DE CONFORMADO	Casting of metallic and nonmetallic materials. Shaping through deformation. Sintering	5
ANÁLISIS Y ENSAYO DE MATERIALES	Techniques of Instrumental Analysis. Defects in Materials. Nondestructive Testing	5
TÉCNICAS DE UNIÓN	Welding and brazing in metallic and nonmetallic materials. Adhesive joining. Mechanical joining	4
MATERIALES METÁLICOS III	Copper Alloys. High-Temperature Alloys. Other Metallic Alloys	4
MATERIALES DE CONSTRUCCIÓN	Concrete and Mortar, Metallic Materials, Composite Materials, Bituminous Materials, Stone, Wood	4
INGLÉS TÉCNICO	Oral and written communication for technical, scientific and corporate environments.	6
TOTAL OFFERED:		34

Degree in Materials Engineering at the UPM

Optional subjects for Itinerary | **B) FUNCTIONAL MATERIALS**

Subject	Contents	ECTS Credits
WORKSHOP ON FUNCTIONAL MATERIALS: STRUCTURE	Semiconductors characterization: Profilometry, SEM, AFM, X-Rays.	6
MATERIALES AVANZADOS PARA OPTOELECTRÓNICA	Detectors, LEDs, Lasers, Waveguides, Solar Cells	5
MATERIALES AVANZADOS PARA MICROELECTRÓNICA	Diodes, Transistors, Filters, MEMS, Magnetic Sensors	5
LABORATORIO DE MATERIALES FUNCIONALES: ELÉCTRICO	Characterization of Semiconductors: Hall, impedance (I-V, C-V), RF; Response of Microelectronic Devices	4
LABORATORIO DE MATERIALES FUNCIONALES: ÓPTICO	Characterization of Semiconductors: Absorption, PL, PR, Ellipsometry; Response of Optical and Optoelectronic Devices	4
INGLÉS TÉCNICO	Oral and written communication (...)	6
TOTAL OFFERED:		30



Degree in Materials Engineering at the UPM

Optional subjects for Itinerary | C) MATERIALS FOR LIFE SCIENCES

Subject	Contents	ECTS Credits
BIOMIMETICS	Self-assembly, Hierarchically Organized Materials, Intelligent Materials, Biosensors	6
BIOMECÁNICA	Biomechanics of the musculoskeletal system, Biomechanics of soft tissues, Biomechanics of fluids	5
BIOSENSORES	Biofunctionalization, Micro-fluidics, Micro- and Nanostructures, Applications	5
INGENIERÍA DEL MATERIAL CELULAR	Cell Membrane, Cytoskeleton, Ribosomes, Mitochondria, Chloroplasts	4
INGENIERÍA DE TEJIDOS	Cells, Cell Signaling, Matrices, Applications	4
LABORATORIO DE MATERIALES BIOLÓGICOS Y BIOMATERIALES	Characterization, Structural Tests, Local Tests, In-Vitro Tests, In-Vivo Tests	4
INGLÉS TÉCNICO	Oral and written communication (...)	6
TOTAL OFFERED:		34

Alternatively to these three itineraries, students can choose one of the following itineraries:

- d) Internship in a Company, which has a more practical orientation and is intended to provide a closer contact with the industry.
- e) Stay in a Foreign Institution, in which the student will take subjects corresponding to itineraries a) b) or c).

The fulfillment of the latter itineraries can be total - by completing a 24 ECTS-credit internship or stay - or partial - which implies the completion of the remaining credits in any of a), b) or c) itineraries.

I.5. TEACHING STAFF

FIRST YEAR

Departamento de Ciencia de Materiales
E.T.S.de Ingenieros de Caminos, Canales y Puertos
Ciudad Universitaria 28040-MADRID
Teléfono.: 91-336-66-79

SUBJECT (Year-semester)	TEACHING STAFF	
Mecánica 1º - 1º	Vicente Sánchez Gálvez	FP
Electricidad y Magnetismo 1º - 1º	Gustavo Plaza Baonza	ASP
Termodinámica 1º - 2º	Jaime Planas Rosselló	FP
Estructura de Materiales II 1º - 2º	Jose Ygnacio Pastor Caño Álvaro Ridruejo Rodríguez	FP IN

Departamento Tecnologías Especiales Aplicadas a la Telecomunicación
E.T.S.de Ingenieros de Telecomunicación
Ciudad Universitaria 28040-MADRID
Teléfono.: 91-336-72-78

SUBJECT (Year-semester)	TEACHING STAFF	
Fundamentos Químicos 1º - 1º	José Ramón Tapia Merino María José Melcón de Giles	AP CAP

Departamento de Matemática e Informática Aplicadas al Ingeniería Civil
E.T.S.de Ingenieros de Caminos, Canales y Puertos
Ciudad Universitaria 28040-MADRID
Teléfono.: 91-336-67-69

SUBJECT (Year-semester)	TEACHING STAFF	
Matemáticas I 1º - 1º	Guillermo Reyes Souto	AP
	Manuel Pastor Pérez	AP
	Dionisio Pérez Esteban	AP
Matemáticas II 1º - 2º	Dionisio Pérez Esteban	AP
	Manuel Pastor Pérez	AP
	Guillermo Reyes Souto	AP



Departamento de Ingeniería de Materiales
E.T.S. de Ingenieros de Minas
C/ Ríos Rosas,21 28003-MADRID
Teléfono.: 91-336-41-77

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Materiales Metálicos I 1º - 2º	José Manuel Ruiz Román Luis García Cambroneró José María García Márquez	AP AP FA

Departamento de Materiales y Producción Aeroespacial
E.T.S. de Ingenieros Aeronáuticos
Plz. Cardenal Cisneros, 3 28040-MADRID
Teléfono: 91-336-63-34

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Estructura de Materiales I 1º - 1º	Nuria Martín Piris José María Badía Pérez	FA AP

Departamento de Silvopascicultura
E.T.S. de Ingenieros de Montes
Ciudad Universitaria 28040 MADRID
Teléfono: 91-336-63-88

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Biología 1º - 2º	Pilar Pita Andreu	AP

FP – Full Professor
AP – Associate Professor
ASP – Assistant Professor
CAP – Collegiate Assistant Professor
IN – Instructor
FA – Faculty Associate

SECOND YEAR

Departamento de Ciencia de Materiales
E.T.S. de Ingenieros de Caminos, Canales y Puertos
Ciudad Universitaria 28040-MADRID
Teléfono.: 91-336-66-79

SUBJECT (Year-semester)	TEACHING STAFF	
Mecánica de Materiales I 2º - 1º	Jaime Planas Rosselló Beatriz Sanz Merino	FP IN
Instrumentación 2º - 2º	Francisco Gálvez Díaz-Rubio Beatriz Sanz Merino	AP IN
Mecánica de Materiales II 2º - 2º	Carlos Daniel González Martínez David Cendón Franco	AP AP
Organización Empresarial 2º - 2º	Vicente Sánchez Gálvez	FP

Departamento de Ciencia de Materiales y Departamento Tecnología Fotónica
E.T.S.I. Caminos, y E.T.S.I. de Telecomunicación
Ciudad Universitaria 28040-MADRID

SUBJECT (Year-semester)	TEACHING STAFF	
Materiales Blandos 2º - 2º	Gustavo Plaza Baonza José Manuel Otón Sánchez Gustavo V. Guinea Tortuero	ASP FP FP

Departamento de Ingeniería y Ciencia de los Materiales
E.T.S. de Ingenieros Industriales
C/ José Gutiérrez Abascal, 2 28006-MADRID
Teléfono.: 91-336-30-24

SUBJECT (Year-semester)	TEACHING STAFF	
Química de Superficies 2º - 1º	José Ramón Ibars Almonacil Antonio Portolés García Cristina Gutiérrez de San Miguel	AP AP FA

Departamento de Ingeniería Química Industrial y del Medio Ambiente
E.T.S. de Ingenieros Industriales
C/ José Gutiérrez Abascal, 2 28006-MADRID
Teléfono.: 91-336-31-90

SUBJECT (Year-semester)	TEACHING STAFF	
Materiales Polímeros 2º - 1º	Victoria Alcázar Montero Jorge Ramírez García	AP ASP



Departamento de Ingeniería de Materiales
E.T.S. de Ingenieros de Minas
C/ Ríos Rosas,21 28003-MADRID
Teléfono.: 91-336-41-77

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Materiales Cerámicos 2º - 1º	Luis García Cambronero José Manuel Ruiz Román Francisco López Martín	AP AP FA

Departamento de Materiales y Producción Aeroespacial
E.T.S. de Ingenieros Aeronáuticos
Plz. Cardenal Cisneros, 3 28040-MADRID
Teléfono: 91-336-63-34

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Materiales Metálicos II 2º - 2º	Juan Manuel Antoranz Pérez José María Badía Pérez Antonio García Simón	CAP AP ASP

Departamento de Ingeniería Electrónica
E.T.S. de Ingenieros de Telecomunicación
Ciudad Universitaria 28040 MADRID
Teléfono: 91-336-73-22

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Propiedades de Materiales I 2º - 2º	Adrián Hierro Cano Fernando Calle Gómez	AP FP

Departamento de Arquitectura y Construcciones Navales
E.T.S. de Ingenieros Navales
Ciudad Universitaria 28040 MADRID
Teléfono: 91-336-71-59

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Física Cuántica 2º - 1º	Juan Carlos Suárez Bermejo	AP

FP – Full Professor
AP – Associate Professor
ASP – Assistant Professor
CAP – Collegiate Assistant Professor
IN – Instructor
FA – Faculty Associate

THIRD YEAR

Departamento de Ciencia de Materiales
E.T.S. de Ingenieros de Caminos, Canales y Puertos
Ciudad Universitaria 28040-MADRID
Teléfono.: 91-336-66-79

SUBJECT (Year-semester)	TEACHING STAFF	
Mechanics of Materials III 3° - 1°	Francisco Gálvez Díaz-Rubio	AP
	Jesús Ruiz Hervias	AP
Composite Materials 3° - 1°	Javier Llorca Martínez	FP
	Carlos Daniel González Martínez	AP
	Jesús Alfredo Güemes Gordo	FP
Simulation 3° - 1°	Javier Segurado Escudero	AP
Biomimetics 3° - 1°	José Pérez Rigueiro	AP
Mechanics of Materials IV 3° - 2°	José Miguel Atienza	AP

Departamento de Ingeniería Electrónica
E.T.S.I. de Telecomunicación
Ciudad Universitaria 28040-MADRID
Teléfono: 91-336-73-22

SUBJECT (Year-semester)	TEACHING STAFF	
Surface Engineering 3° - 2°	Enrique Calleja Pardo	FP
Nanotechnology 3° - 2°	Fernando Calle Gómez	FP
	Elías Muñoz Merino	FP

Departamento de Tecnología Electrónica
E.T.S.I. de Telecomunicación
Ciudad Universitaria 28040-MADRID
Teléfono: 91-336-72-19

SUBJECT (Year-semester)	TEACHING STAFF	
Workshop on Functional Materials: Structural 3° - 1°	Jesús Sangrador García	FP
	Enrique Iborra Grau	FP
	Marta Clement Lorenzo Iriarte	AP
	Gonzalo Fuentes	ASP
	Jimena Olivares Roza	ASP



Departamento de Física Aplicada a las Tecnologías de la Información
E.T.S.I. de Telecomunicación
Ciudad Universitaria 28040-MADRID
Teléfono: 91-336-72-71

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Properties of Materials II 3° - 1°	José Luis Prieto Claudio Aroca Hernández-Ros Marco Maicas Ramos María del Mar Sanz LLuch Manuel Muñoz Sánchez	ASP FP AP ASP FA

Departamento de Ingeniería de Organización
E.T.S. de Ingenieros Industriales
C/ José Gutiérrez Abascal, 2 28006-MADRID

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Quality and Quality Management 3° - 2°	Jorge de Esteban Ortega Mª Ángeles Huerta Carrascosa	FA FA

Departamento de Ingeniería de Materiales
E.T.S. de Ingenieros de Minas
C/ Ríos Rosas,21 28003-MADRID
Teléfono: 91-336-41-77

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Obtaining of Materials 3° - 1°	José Manuel Fidalgo Alonso José Luis Tejera Oliver	AP AP
Recycling of Materials 3° - 2°	José Manuel Fidalgo Alonso José Luis Tejera Oliver	AP AP

Departamento de Lingüística Aplicada a la Ciencia y a la Tecnología
E.T.S. de Ingenieros Navales
Ciudad Universitaria 28040 MADRID
Teléfono: 91-336-55-62

<u>SUBJECT</u> <u>(Year-semester)</u>	<u>TEACHING STAFF</u>	
Technical English 3° - 1°	Silvia Molina Plaza	AP

FP – Full Professor
AP – Associate Professor
ASP – Assistant Professor
CAP – Collegiate Assistant Professor
IN – Instructor
FA – Faculty Associate

I.6. THE SPANISH SYSTEM OF CREDITS AND GRADES

ECTS

The European Credits Transfer System (ECTS) is the credit system for higher education used in the European Higher Education Area. It is aimed to facilitate planning, delivery, evaluation, recognition and validation of qualifications and units of learning as well as student mobility. The system is based on the workload needed to achieve expected learning outcomes, so it has not a fixed measurement in hours. 60 ECTS credits are attached to the workload of a full-time year of formal learning (academic year) and the associated learning outcomes. In most cases, one credit corresponds to 25-30 hours of work including between 8 and 12 hours of classroom lessons.

GRADES

The Spanish grades system is a decimal system from 0 to 10. These grades are accompanied on the student record by a non-numerical grade. The grading system is depicted in the following table:

A	Best 10%	>8,2
B	Following 25%	7 - 8.2
C	Following 30%	6 - 7
D	Following 25%:	5 - 6
E	Following 10%:	5
F	Fail	<5

To pass a subject it is necessary to obtain a grade of at least 5. This can be done in three ways. The first (and recommended one) is [continuous assessment](#), in which regular exams and other activities are evaluated. The second way is a [final written or oral exam](#) which must be passed in order to pass the subject. If students do not pass this end-of-semester exam, they will automatically undergo the third way, which implies re-sitting the exam during the [second-opportunity exams](#), which take place in July.



I.7. ACADEMIC CALENDAR (2011-2012)

MONTH/DAY/YEAR	
09/02/11	Official Opening of the Academic Year. Fall semester begins.
09/05/11	First day of classes
09/09/11	Academic and Administrative Holiday
10/12/11	Academic and Administrative Holiday
11/01/11	Academic and Administrative Holiday
11/09/11	Academic and Administrative Holiday
12/06/11	Academic and Administrative Holiday
12/08/11	Academic and Administrative Holiday
12/22/11- 1/8/12	Christmas Holidays
01/09/12	Final Examinations begin
01/23/12	First day for registration for the Spring semester
01/24/12	End of Final Examinations. Fall semester ends
01/27/12	Academic Holiday
02/03/12	Last day for registration for the Spring semester
02/06/12	First day of classes of the Spring semester
04/02/12-03/10/12	Easter Holidays
04/10/12	Classes resume
05/01/12	Academic and Administrative Holiday
05/02/12	Academic and Administrative Holiday
05/15/12	Academic and Administrative Holiday
06/01/12	Last Day of Classes
06/04/12	Final examinations (Spring semester)
06/20/12	End of Final Examinations. Spring semester ends
07/02/12	Second opportunity examinations begin
07/17/12	Second opportunity examinations end
07/16/12	First day for registration for the next (2012-2013) fall semester

I.8. TIMETABLE

FIRST YEAR • FALL SEMESTER

CLASSROOM 24

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
09:00-10:30	Electricidad y Magnetismo	Fundamentos Químicos	Fundamentos Químicos	Estructura I	Mecánica
10:30-12:00	Mecánica	Estructura I	Matemáticas I	Matemáticas I	Electricidad y Magnetismo
12:00-12:15	Break				
12:15-14:15	Estructura I	Mecánica	Electricidad y Magnetismo	Fundamentos Químicos	Matemáticas I



FIRST YEAR • SPRING SEMESTER

CLASSROOM 24

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
09:00-10:30	Termodinámica	Termodinámica	Estructura II	Estructura II	Materiales Metálicos I
10:30-12:00	Materiales Metálicos I	Matemáticas II	Biología	Biología	Matemáticas II
12:00-12:15	Break				
12:15-14:15	Estructura II	Materiales Metálicos I	Matemáticas II	Termodinámica	Biología

SECOND YEAR • FALL SEMESTER

CLASSROOM 24

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
15:00-16:30	Química de Superficies	Química de Superficies	Materiales Cerámicos	Materiales Cerámicos	Física Cuántica
16:30-18:00	Materiales Polímeros	Mecánica de Materiales I	Mecánica de Materiales I	Física Cuántica	Materiales Polímeros
18:00-18:15	Break				
18:15-20:15	Mecánica de Materiales I	Materiales Cerámicos	Física Cuántica	Materiales Polímeros	Química de Superficies



SECOND YEAR • SPRING SEMESTER

CLASSROOM 24

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
15:00-16:30	Instrumentación	Organización Empresarial	Organización Empresarial	Instrumentación	Materiales Blandos
16:30-18:00	Mecánica de Materiales II	Propiedades de Materiales I	Mecánica de Materiales II	Materiales Metálicos II	Propiedades de Materiales I
18:00-18:15	Break				
18:15-19:15	Organización Empresarial	Materiales Metálicos II	Mecánica de Materiales II	Materiales Blandos	Propiedades de Materiales I
19:15-20:15			Instrumentación		

THIRD YEAR • FALL SEMESTER

CLASSROOM 15

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
09:00-10:30	Numerical Simulation	Properties of Materials II	Composite Materials	Mechanical Behavior of Materials III	Obtaining of Materials
10:30-12:00	Composite Materials	Mechanical Behavior of Materials III	Numerical Simulation	Properties of Materials II	Biomimetics
12:00-12:15	Break				
12:15-13:15	Composite Materials	Mechanical Behavior of Materials III	Numerical Simulation	Properties of Materials II	Workshop on Functional Materials (*)
13:15-14:15	Obtaining of Materials / English	Biomimetics / English	Obtaining of Materials / English	Biomimetics / English	Workshop on Functional Materials (*)

* NOTE: The classes corresponding to this subject will be held at the labs located in the School of Telecommunication Engineering and ISOM



THIRD YEAR • SPRING SEMESTER

CLASSROOM 15

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
09:00-10:30	Mechanical Behavior of Materials IV	Recycling of Materials	Quality and Quality Management	Surface Engineering	Nanotechnology
10:30-12:00	Nanotechnology	Surface Engineering	Mechanical Behavior of Materials IV	Recycling of Materials	Quality and Quality Management
12:00-12:15	Break				
12:15-13:15	Nanotechnology	Surface Engineering	Mechanical Behavior of Materials IV	Recycling of Materials	Quality and Quality Management

1.9. EXAM DATES (2011-2012)

FIRST YEAR • FINAL EXAMS

FIRST (FALL) SEMESTER

DATE	TIME	CODE	SUBJECT
09 January, Monday	10.00 h	45000003	Fundamentos Químicos
12 January, Thursday	10.00 h	45000002	Electricidad y Magnetismo
16 January, Monday	10.00 h	45000008	Estructura I
19 January, Thursday	10.00 h	45000004	Matemáticas I
23 January, Monday	10.00 h	45000006	Mecánica

SECOND (SPRING) SEMESTER

DATE	TIME	CODE	SUBJECT
4 June, Monday	10.00 h	45000001	Biología
7 June, Thursday	10.00 h	45000009	Estructura II
11 June, Monday	10.00 h	45000007	Termodinámica
14 June, Thursday	10.00 h	45000037	Materiales Metálicos I
18 June, Monday	10.00 h	45000005	Matemáticas II



SECOND OPPORTUNITY EXAMS (FIRST YEAR)

DATE	TIME	CODE	SUBJECT
02 July, Monday	10.00 h	45000002	Electricidad y Magnetismo
03 July, Tuesday	10.00 h	45000003	Fundamentos Químicos
04 July, Wednesday	10.00 h	45000008	Estructura I
05 July, Thursday	10.00 h	45000006	Mecánica
06 July, Friday	10.00 h	45000004	Matemáticas I
09 July, Monday	10.00 h	45000037	Materiales Metálicos I
10 July, Tuesday	10.00 h	45000001	Biología
11 July, Wednesday	10.00 h	45000005	Matemáticas II
12 July, Thursday	10.00 h	45000009	Estructura II
13 July, Friday	10.00 h	45000007	Termodinámica

SECOND YEAR • FINAL EXAMS

FIRST (FALL) SEMESTER

DATE	TIME	CODE	SUBJECT
10 January, Tuesday	16.30 h	45000023	Química de Superficies
13 January, Friday	16.30 h	45000039	Materiales Polímeros
17 January, Tuesday	16.30 h	45000033	Materiales Cerámicos
20 January, Friday	16.30 h	45000017	Física Cuántica
24 January, Tuesday	16.30 h	45000012	Mecánica de Materiales I

SECOND (SPRING) SEMESTER

DATE	TIME	CODE	SUBJECT
05 June, Tuesday	16.30 h	45000013	Mecánica de Materiales II
08 June, Friday	16.30 h	45000018	Propiedades de Materiales I
12 June, Tuesday	16.30 h	45000022	Materiales Blandos
13 June, Wednesday	16.30 h	45000010	Instrumentación
15 June, Friday	16.30 h	45000053	Organización Empresarial
19 June, Tuesday	16.30 h	45000038	Materiales Metálicos II



SECOND OPPORTUNITY EXAMS (SECOND YEAR)

DATE	TIME	CODE	SUBJECT
02 July, Monday	16.30 h	45000012	Mecánica de Materiales I
03 July, Tuesday	16.30 h	45000017	Física Cuántica
04 July, Wednesday	16.30 h	45000033	Materiales Cerámicos
05 July, Thursday	16.30 h	45000039	Materiales Polímeros
06 July, Friday	16.30 h	45000023	Química de Superficies
09 July, Monday	16.30 h	45000013	Mecánica de Materiales II
10 July, Tuesday	16.30 h	45000018	Propiedades de Materiales I
11 July, Wednesday	16.30 h	45000022	Materiales Blandos
12 July, Thursday	16.30 h	45000010	Instrumentación
13 July, Friday	16.30 h	45000053	Organización Empresarial
16 July, Monday	16.30 h	45000038	Materiales Metálicos II

THIRD YEAR • FINAL EXAMS

FIRST (FALL) SEMESTER

DAY	TIME	CODE	SUBJECT
09 January, Monday	10.00 h	45000048	Numerical Simulation
11 January, Wednesday	10.00 h	45000031	Biomimetics
12 January, Thursday	10.00 h	45000019	Properties of Materials II
16 January, Monday	10.00 h	45000034	Composite Materials
18 January, Wed.	10.00 h	45000043	Workshop on Functional Materials
19 January, Thursday	10.00 h	45000014	Mechanical Behavior of Materials III
23 January, Monday	10.00 h	45000028	Obtaining of Materials
24 January, Tuesday	10.00 h	45000054	English

SECOND (SPRING) SEMESTER

DATE	TIME	CODE	SUBJECT
04 June, Monday	10.00 h	45000015	Mechanical Behavior of Materials IV
07 June, Thursday	10.00 h	45000049	Recycling of Materials
11 June, Monday	10.00 h	45000052	Quality and Quality Management
14 June, Thursday	10.00 h	45000050	Surface Engineering
18 June, Monday	10.00 h	45000020	Nanotechnology



SECOND OPPORTUNITY EXAMS (THIRD YEAR)

DATE	TIME	CODE	SUBJECT
02 July, Monday	10.00 h	45000048	Numerical Simulation
03 July, Tuesday	10.00 h	45000028	Obtaining of Materials
04 July, Wednesday	10.00 h	45000031	Biomimetics
05 July, Thursday	10.00 h	45000014	Mechanical Behavior of Materials III
06 July, Friday	10.00 h	45000019	Properties of Materials II
09 July, Monday	10.00 h	45000043	Workshop on Functional Materials
10 July, Tuesday	10.00 h	45000034	Composite Materials
11 July, Wednesday	10.00 h	45000054	English
12 July, Thursday	10.00 h	45000052	Quality and Quality Management
13 July, Friday	10.00 h	45000020	Nanotechnology
16 July, Monday	10.00 h	45000050	Surface Engineering
16 July, Monday	16.30 h	45000015	Mechanical Behavior of Materials III
17 July, Tuesday	10.00 h	45000049	Recycling of Materials

I.10. SERVICES AT THE SCHOOL AND THE UNIVERSITY

▶ **Libraries:** The UPM has a large library network consisting of 20 libraries at the different Centers of Study and 2 Documentation Centers. The library at the School of Civil Engineering (Caminos) can be found on Floor -1.

Library opening hours are Monday to Friday from 9.00 am to 9.00 pm. During exams some of the libraries are open longer.

Students may ask for up to 3 books to use in the reading-room, and borrow them in most cases. All students of the UPM may request the use of laptops. They must have a mail account with the UPM.

▶ **Wi-Fi on Campus:** The Wi-Fi network is available at all the Schools of the UPM and at the Rector's Office. This means that users from any School can connect to the network at the areas provided for this purpose at any other School of the UPM. In order to access the wireless network you will need to set up an email account at the university and have a portable computer with a wireless network card.

▶ **Copying and Printing Services:** it is located on the main floor, between the cafeteria and the chapel.

Mon. - Fri.: 8.30 am - 2 pm and 3 pm - 6.30 pm.

▶ **Bookstore:** specialized in technical books, includes a section of stationery. It is placed next to the library.

Mon. - Fri.: 8.30 am - 2 pm and 3 pm - 6.30 pm.

▶ **Psychologist:** This service provides advice and psychological support to students of the UPM. The aim of the service is to improve students' academic performance by acting on factors of a psychological nature which may have a negative effect during academic training.



Please contact Marta Ramírez at psicocaminos@gmail.com

Visiting Hours: Wed. 12.15 pm - 2.15 pm and Fri. 5-7pm. 7th Floor.

Alternatively, you may also contact Ángeles García Medyca at psicología@medyca.com or else angellison@correo.cop.es.

▶ **University Ombudsman (Defensor Universitario)** watches over the rights and liberties of teaching staff, students and administration and service staff. At the UPM, the objective is to perform these functions in an efficient, sympathetic manner with particular emphasis on improving the quality of the university through all the undertakings of this office.



Rectorado. Edificio A.
Avenida Ramiro de Maeztu, 7 Sótano 1
28040 Madrid
www.upm.es/laupm/defensor

▶ **Student Council (Delegación de Alumnos):** The Student Council represents students and defends their interests, providing them with advice and assistance concerning academic and other matters which affect university life. The Council also promotes cultural and sports activities and supports activities undertaken by students at each Center of Study. Each Center has a Student Council office.



<http://delegacion.caminos.upm.es/web>
Tel.: 91. 336 67 78 | delegacion.alumnos.caminos@upm.es

▶ **COIE (Career Guidance and Information Center):** The purpose of the UPM Career Guidance and Information Center is to provide information and guidance to students in relation to joining the workforce, particularly in terms of work experience and looking for their first job.



COIE (Centro de Orientación e Información de Empleo)
Rectorado. Edificio B. Paseo Juan XXIII, 11. 28040 Madrid
Tel.: 91 336 62 32/20 | www.coie.upm.es/public/index.php | coie@upm.es
Open from 9.00 am to 2.00 pm from Monday to Friday.

▶ **Spanish Language Courses:** The UPM has a language program with an international focus which includes:

- ▶ Intensive online course to bring foreign students up to the appropriate level.
- ▶ Spanish courses applied to Science and Technology.
- ▶ Intensive foreign language courses. Exchange programs.
- ▶ DELE - Diploma of Spanish as a Foreign Language.

Courses for foreign students start in September for those who arrive in the first semester and in February for those who arrive in the second semester. There are also courses on line. For further information, check www.upm.es/internacional/Students/ExchangeMobilityPrograms/Languages+for+Internationalization/Spanish+Language+Area or send an email to programa.lenguas@upm.es.

▶ **Student Clubs** play a major role at the UPM. There are a variety of clubs operating, with activities in a variety of fields ranging from all kinds of cultural activities such as cinema, theater, *tunas* (student musical groups in traditional costumes) and photography to professionally-oriented clubs for exchange and research. If you would like to be a member of a club or take part in their activities, you can find out about the clubs at your Center of studies, or by going to the Sub-director responsible for University Extension, the Student Council at your Center of Study, or the Student Services and University Extension Office. You can also find information on the following web page: <http://www.caminos.upm.es/alumnado/asociacion.html> or by email: extension.universitaria@upm.es.

▶ **Cultural Activities:** The UPM organises a large number of cultural activities at low prices aimed at all UPM students. The Cultural Service (Aula de Cultura) organises courses of all kinds: photography, cinema, short films, storytelling, public speaking, astronomy, visits to art museums, ballroom dancing, Latin dancing, Flamenco, gardening, biodancing, magic and illusionism, music and much more. During the academic year courses are held from October to February and from March to June.

Every year the UPM holds its highly successful Theater Festival. The university's 11 theater groups put on more than 20 plays, including comedy, drama, theater of the absurd and musicals. The performances are seen by more than 6500 spectators and all interested students may take part.

Foreign students wishing to take part in any of these activities should request information at extension.univeristaria@upm.es

▶ **Sports:** The UPM promotes and encourages sports activities by organising and participating in internal and Spanish universities championships and running a variety of activities at its sports facilities.

For students interested in taking part in sports, the university runs the following activities: aerobics, chess, badminton, basketball, handball, fencing, football, indoor football, 7-a-side football, fitness, gym-jazz, karate, kung-fu, bodybuilding, swimming, paddle tennis, rugby, squash, taekwondo, tennis, table tennis, volleyball and beach volleyball.

Deportes (Sports Office)

Paseo Juan XXIII, 11. 28040 Madrid

Tel.: 91 336 62 34/28 | www.upm.es/institucional/upm/deportes



2. STUDYING IN MADRID

2.1. GETTING TO MADRID



By plane: There are daily flights between Madrid-Barajas Airport and the main capital cities in Europe and capitals in other parts of the world. There are also several daily flights to the other principal Spanish airports.

The Madrid-Barajas airport is located at Km. 13 of the Barcelona Motorway. It consists of 4 terminals: T1, T2, T3 and T4. Transport to the city center is by bus, with departures every ten minutes, or by Metro (line 8). There is also a taxi service, and a yellow shuttle bus (called 'Aeropuerto Express') which works 24 hours a day (daytime: Airport – Atocha Station, every 15 minutes; nighttime: Airport – Cibeles Square, every 35 minutes). The bus fare is 2 € and it takes some 40 minutes.

Barajas Airport Information:

0034 - 91 305 83 43 | 0034- 91 305 83 44 | 0034- 91 305 83 45

General Information AENA (Spanish Airports Authority): 902 404 704



By train: Madrid has two main train stations:

▶ **Chamartín:** Located in the north of the city, this station connects with the cities of Northern Spain. It is also the station for trains to and from France.

Address: Calle Agustín de Foxá. Metro station: Chamartín.

▶ **Atocha:** Located in the south of the city, this station connects with Seville, Valencia and Barcelona. It is the point of arrival and departure for the high-speed train (AVE) and also the station for local trains in and around the capital. There is an underground train connection to the Chamartín station.

Further information: www.renfe.es

Information and bookings: 902 24 02 02.

International information: 902 24 34 02.

Internet sales information: 902 15 75 07.

International discount train passes:

► **Interail:** This pass allows train travel in more than 30 European countries in first or second class over several days. Further information on the web page: www.interrailnet.com

► **Eurail:** This is an international pass, with no limits depending on the kind of pass chosen, which may be purchased by persons with permanent residence outside of Europe, the Federation of Russia or Turkey. This is an individual, non-transferable pass requiring ID.

► **Rail Plus:** This is an individual, non-transferable card which allows holders to purchase train tickets at special prices from certain companies.



By bus: Eurolines is responsible for transport to the main European cities and further destinations, including Berlin, Fez, Frankfurt, Hamburg, Lisbon, Marrakech, Munich, Naples, Prague, Toulouse and Warsaw.

Tel.: 902 405 040 | www.eurolines.es | info@eurolines.es

Several agencies organise journeys from most European countries: Germany, Andorra, Belgium, Bulgaria, France, Holland, Italy, Poland, Portugal, Czech Republic, Rumania, Switzerland and the Ukraine, arriving at the Madrid South bus station (Estación Sur de Autobuses). Due to possible changes you should find out about these bus services in your country of origin.

There are two main bus stations:

► La **Estación Sur de Autobuses** is the largest bus station in Madrid. You can take a bus from this station to most Spanish cities. Several bus companies operate from here.

Metro: Méndez Álvaro (L6). Cercanías: Méndez Álvaro.

Calle Méndez Álvaro, 83

28045- Madrid

Tel.: 91 468 42 00 | www.estacionautobusesmadrid.com

► La **Estación de Avenida de América** concentrates all itineraries operated by ALSA and PLM. It connects with Barajas International Airport: Lines 200 (T1, T2 and T3) and 204 (T4).

Metro: Avda. de América (L 4, 6, 7, 9).

Address: Avda. de América, 9. 28002 | Tel.: 91 561 56 38.



By road: Entry into Spain by road is through France or Portugal. Coming from France you can take one of the following expressways:

A1: Irun-Burgos-Madrid

A2: La Junquera-Barcelona-Zaragoza-Madrid

A7: French border-Barcelona; A2: Barcelona-Madrid

From Portugal: A5 Badajoz-Madrid

Provincial Traffic Headquarters (Jefatura Provincial de Tráfico) Information:
Tel.: 00 34 91 30185 00/ 00 34 91 510 44 70.

Travel times to Madrid: From Barcelona - 6 hours 30 minutes; from Sevilla - 6 hours; from Lisbon - 6 hours 30 minutes.

Expressways (autovías) are indicated with the letter A; motorways (autopistas) are indicated with the letters AP; national roads with more than one carriageway between cities and towns are indicated with the letter N; and the Madrid ring roads are indicated by the letter M. Expressways, motorways and the main national roads are indicated by a letter followed by either one, two or three digits. Many of the motorways are toll roads.

In Spain driving is on the right and no one under the age of 18 may hire or drive a vehicle of more than 75 cc. Seatbelts are compulsory in the front seats of cars, and helmets are compulsory on motorcycles. The speed limits for cars and motorcycles are 120 km/h on expressways, 100 km/h on dual carriageways, 90 km/h on roads outside built-up areas and 50 km/h in cities or towns. The legal blood alcohol limit is 0.50mg/l and anyone over this limit will be fined €600. The use of mobile telephones or any other medium or system of communication while driving is prohibited. A points system operates in Spain whereby all drivers are awarded an initial credit of 12 points. Certain driving offences result in the loss of points.

Foreign visitors need a driving licence valid for Spain. Driving licences from all European Union countries are accepted, although citizens of countries such as the USA, Canada or Australia must obtain an international licence. Third party insurance is recommended and car insurance and documentation must be carried at all times. A Green Card (Tarjeta Verde) is also recommended, although it is only compulsory for persons from outside the European Union.

2.2. LIVING IN THE CITY

Situated in the geographical center of the country, Madrid is the capital of Spain and of the Community of Madrid. With a population of over five and a half million it is considered to be Spain's largest city.

Madrid is the location for the central offices of the Government and Parliament and the main centers of the central public administration. It is also the official place of residence of the Spanish royal family.

In terms of the economy, Madrid is noted for being a major financial and industrial center, home to the head offices of numerous Spanish companies and several of the world's largest corporations.

2.2.1. CLIMATE

Winter in Madrid is not very cold, with minimum temperatures of around 2°C and maximums of around 15°C. Spring and autumn are pleasant, with maximum temperatures of around 20.5°C and minimums of 7.5°C. Summer in Madrid is hot, with maximum temperatures ranging from 30°C to 40°C. Madrid is fortunate to have a majority of sunny days throughout the year.



A fully detailed weather forecast is available at:

<http://www.aemet.es/en/eltiempo/prediccion/municipios/madrid-id28079>

2.2.2. TRANSPORT



Metro: This is the quickest way to move around Madrid, with regular services running at very frequent intervals from 6.00 am to 1.30 am every day of the week. There are single tickets and 10-trip tickets as well as monthly passes that let you travel as many times as you want during the month. The price of a monthly ticket varies depending on the zone and on the age of the user and is valid for travel on both the metro and buses, but the standard ticket (valid for the central area of the city) costs 1€.



You can see a map of the metro and check the prices on the web page www.metromadrid.es/en/index.html | Tel.: 902 44 44 03.



Urban buses (EMT): There are more than 193 regular bus routes in Madrid, run by the Municipal Transport Company (EMT - Empresa Municipal de Transportes), which go to all parts of the city, running from 6:00 am to midnight. There are single tickets and 10-trip tickets, which are valid for both the metro and buses. Buses are usually red or blue. There are also night buses which run from midnight to 6.00 am.



Information on bus routes and fares: www.emtmadrid.es

Customer services office: 902 50 78 50.



Local trains (Cercanías): The local train network of the Spanish train company (RENFE) runs between most of the towns around Madrid and the city center. Local train fares vary depending on the zone. Trains run from 5:00 am or 6:00 am (depending on the line) until midnight or 1:00 am. There are several types of tickets and fares.



www.renfe.es/cercanias/madrid/index.html

Information and bookings: 902 24 02 02

For further information on these and other transport facilities in the city, please check the website of the Consorcio de Transportes de Madrid: <http://www.ctm-madrid.es>



Taxis: Madrid taxis are white with a diagonal red stripe and the city shield on the side. A green light or a sign saying *libre* (available) shows when taxis are not carrying passengers. The fare consists of an initial fixed rate, known as the flag fall (*bajada de bandera*), which increases in accordance with the number of kilometres covered. There are additional charges for fares to the airport or train stations, for the carriage of suitcases and for night rates and public holidays. All taxis must display information on the rate for the flag fall and additional charges.



www.radiotelefono-taxi.com

Tel.: Radio Taxi: 915 478 200

2.2.3. ACCOMMODATION

The best way to find accommodation is to check what's available on www.upm.es/institucional/FuturosEstudiantes/AtencionAlumno/Alojamiento in order to book provisional accommodation in Madrid before you arrive. This will enable you to find accommodation more appropriate to your needs once you are established in Madrid. This service is solely and exclusively for the purposes of providing information on accommodation available. It does not organise accommodation for students. If you have not organised accommodation before your arrival you can go to the Student Accommodation Office (Oficina de Alojamiento de Estudiantes), where you will be informed about the different types of accommodation, or to the Student Mobility Office (Oficina de Movilidad de Estudiantes) or the International Relations Office (Relaciones Internacionales) of your Center of studies, where you will also receive advice. It is open from Monday to Friday from 9.00 am to 2.00 pm.

2.2.4. HEALTH INSURANCE

► **Social Security:** If you are from a country within the European Union, all you need to do is apply for the European Health Insurance Card in your own country. With this card you will be able to access the Spanish Social Security during your time in Spain. Once you are in Madrid, you will need to find out which is your designated health center. This will depend on which part of the Community of Madrid you are resident in. You can receive information about your health center or any other information on Social Security in Spain by calling 900-166565. If you are from outside the European Union but from a country which has signed a medical assistance agreement with Spain (find out about this before departure), you will need to bring the corresponding form with you and proceed in the same manner as European Union citizens.

www.seg-social.es

► **Private health insurance:** If you have no Social Security in your country of origin or there is no kind of medical agreement with Spain, you will need to take out private health insurance. This must in all cases provide full health cover during your time at the UPM. You may take out a policy in your country of origin or when you arrive in Spain. More information can be found at:

www.upm.es/internacional/Students/Student+Attention



2.2.5. PRACTICALITIES

▶ **Currency and Cost of Living**

The official currency in Spain is the euro (€). The approximate cost of staying in Madrid ranges from 600 to 1000 euros a month (accommodation and food), taking into account that this will depend on the cost of your accommodation. For example, sharing a rented flat will cost around 400 euros (accommodation only).

The following list of articles and prices is provided as a guideline:

- ▶ A one-way ticket for a journey by bus or metro: 1 euro.
- ▶ 10-trip metrobus ticket: 9.30 euros
- ▶ Cinema ticket: 7 euros (approx.)
- ▶ Soft drink or beer: 2.00 euros
- ▶ Newspaper: 1.20 euro.

▶ **Banks and Savings Banks**

Usual opening hours for banks and savings banks are from 8:30 am to 2:00 pm. Savings banks also open on Thursday afternoons.

To open an account you will need a resident or non-resident certificate and your passport. If you already have a resident certificate, that is all you will need to provide at the bank when you open an account.

If you are a non-resident you will need to obtain a non-resident certificate from the Comisaría General de Documentación (Foreign Office) in Calle General Pardiñas, number 90 (metro station Diego León) in Madrid. You will need the original and a photocopy of your passport. Applications are processed in around ten days. With your passport and this certificate you will be able to open an account at any bank.

▶ **Credit Cards:** Major cards, such as Visa, MasterCard, Maestro, Cirrus and, to a lesser extent, Amex, are accepted throughout Spain. They can be used in many hotels, restaurants and shops; in doing so you'll need to show some form of photo ID (eg passport). Credit cards can also be used in ATMs displaying the appropriate sign (if there's no sign, don't risk it), or, if you have no PIN, you can obtain cash advances over the counter in many banks. Check charges with your bank.



If your card is lost, stolen or swallowed by an ATM, you can call the following numbers toll-free to have an immediate stop put on its use:

Amex: 902 375 637.

Diners Club: 91 211 43 00, 902 40 11 12.

MasterCard: 900 971 23.

Visa: 902 192 100.

► Discount Cards

► **UPM Student ID Card:** The UPM provides all of its students with ID cards, including students on exchange programs. Student ID cards entitle holders to use all the services and facilities at the UPM. They can also be used to obtain discounts at certain shops, cinemas, theaters...

► **Euro <26 Youth Card:** This card is part of the European Network aimed at young people from the ages of 14 to 25. It allows cardholders to benefit from discounts and services offered to young people throughout Europe: transport, shops, sports, gifts, computers and a lot more. It also includes travel insurance which covers cardholders from a distance of 25 km beyond their usual place of residence. EURO<26 cards are valid for two years.

► **ISIC (International Student Card):** This card identifies the holder as a student from outside of Spain and provides discounts on transport, accommodation, admission to museums and so on. You must prove you are a student in order to obtain this card. The minimum age is 12. The card is valid from September of the current year until December of the following year, starting from the date the card is issued.

► **Youth Hostels (Albergues Juveniles - REAJ and IYHF):** An International Youth Hostel Federation card entitles holders to use the 206 Youth Hostels in Spain, through the Spanish Youth Hostels Network (Red Española de Albergues Juveniles) and gives them access to more than 4200 youth hostels in other countries participating in the IYHF. All young people may apply for an IYHF card, of which different types exist: -Youth (ages 14 to 29); Adult (ages 30 and over); Group (minimum 10 persons) for under 30s, including at least one person over the age of 18; and Family, for Spanish couples with children under the age of 14.



▶ **Over 26 Youth Card:** This program aims to make culture and leisure available to young people in Madrid aged from 26 to 29 (inclusive). An initiative of the Community of Madrid Directorate General for Youth, in conjunction with the savings bank Caja Madrid, this card will entitle you to major discounts. You can obtain information on how to obtain these cards before leaving home. In Madrid they are issued at:

Oficina de Turismo Juvenil – TIVE (Youth Tourism Office)

Calle Fernando el Católico 88

28015- Madrid

Tel.: 91-5437412 | tive.juventud@madrid.org

Open from Monday to Friday from 9 am to 2 pm.

Dirección General de Juventud (Directorate General for Youth)

Calle Gran Vía, 10

From Monday to Friday from 9 am to 2 pm and from 5 pm to 8 pm.

Tel.: 900 70 80 10 | carnetjoveneuro26@madrid.org

www.madrid.org

Other useful links for discount cards:

www.isic.org | www.euro26.org | www.wysetc.org

▶ **Business hours:** generally speaking, business hours are from 9 am to 8pm, though some supermarkets are open 24 hours a day. Restaurants remain open until midnight or even later.

▶ **Tipping:** customers are not expected to leave a fixed percentage of the bill. Small tips – from 10 cents up to 2 euros – are frequent at bars and restaurants, depending on the amount due.

▶ **Post:** Post offices are usually open from 8:30 am to 2:30 pm from Monday to Friday, although some offices are also open in the afternoon, depending on the services provided. There is an on-campus post office in Ciudad Universitaria, located at Avenida de la Complutense number 99, open from 8:30 am to 2:30 pm. For further information call 902 197 197 or check the website www.correos.es

- ▶ **Internet Access:** there are plenty of wi-fi spots around the city (many cafeterias in the center are provided with connection points).
- ▶ **Voltage:** 220-240 V, 50 Hz, with Type C (Europlug) two-prong plug.
- ▶ **General Safety Information:** Madrid is a generally safe city, although you should, as in most European cities, be wary of pickpockets in the city center, on the metro and around major tourist sights. However, the overwhelming majority of travellers to Madrid rarely encounters any problems. You need to be especially careful in the most heavily touristed parts of town, notably the Plaza Mayor and surrounding streets, the Puerta del Sol, El Rastro, the Museo del Prado and Atocha. Tricks abound. They usually involve a team of two or more (sometimes one of them an attractive woman to distract male victims). While one attracts your attention, the other empties your pockets. Be wary of jostling on crowded buses and the metro and, as a general rule, dark, empty streets are to be avoided; luckily, Madrid's most lively nocturnal areas are generally busy with crowds having a good time.
Dial **112** to reach emergency services.

2.2.6. CULTURAL TOURISM

The city of Madrid has an extensive range of cultural attractions which students should take the time to discover.

The large number of museums include the History Museum, Museum of Archaeology, Museum of Natural Sciences, the Army Museum and the Museum of America, although the most important ones are:

- ▶ **Museo del Prado (El Prado Art Museum):** This is one of the world's major art museums. It is located in Paseo del Prado and is open from Tuesday to Sunday and on public holidays from 9:00 am to 8:00 pm. Closed on Mondays.

Metro stations: Banco de España and Atocha.

Centro de Atención al Visitante (Visitors' Information Center): 902 107077.

<http://museoprado.mcu.es/home.html>

- ▶ **Museo Thyssen-Bornemisza:** Exhibition of paintings covering a wide range of masters and schools, from early Netherlandish painting to the contemporary avant-garde.



Located in the Palacio de Villahermosa, Paseo del Prado number 8. Open from Tuesday to Sunday from 10.00 am to 7.00 pm. Closed on Mondays.

Metro: Banco de España | Tel.: 91- 369 01 51 | www.museothyssen.org

► **Museo Nacional Centro de Arte Reina Sofía:** Modern and contemporary paintings and sculptures. Located in Calle Santa Isabel, number 52. Open on Mondays and from Wednesday to Saturday from 10:00 am to 9:00 pm and on Sundays from 10:00 am to 2.30 pm. Closed on Tuesdays.

Metro: Atocha | Tel.: 91 7741000 | www.museoreinasofia.es

► **El Palacio Real (Royal Palace):** The Spanish royal palace is one of the best in Europe. It opens from Monday to Saturday from 9:30 am to 5:00 pm and on Sundays and public holidays from 9:00 am to 2:00 pm. Closed on the occasion of official events.

Metro: Ópera | Tel.: 91 4548800 | www.patrimoniounacional.es

► **Plaza Mayor:** This is a large square surrounded by balconied buildings constructed between 1617 and 1619. The most emblematic buildings are the *Casa de la Panadería* and the *Casa de la Carnicería*. Metro station: Sol.

► **El Parque del Retiro:** This is the most historically and artistically important park in Madrid. Located in Plaza de la Independencia. Metro Station: Retiro and Menéndez Pelayo.

► **El Rastro de Madrid:** The Rastro is a street market covering several streets of Madrid, around Plaza de Cascorro, La Latina, Calle Embajadores and the surrounding area. It is held on Sundays from 9:00 am to 3.00 pm. Metro station: La Latina.

► **Parque de Atracciones de Madrid (Amusement Park):** Located in the natural setting of La Casa de Campo. Metro station: Batán. It can also be reached by bus, numbers 33 or 65.

Tel.: 91 463.29.00 | www.parquedeatracciones.es

► **Other places to visit:** Catedral de Nuestra Señora de la Almudena (Cathedral of Our Lady of Almudena), Iglesia San Francisco El Grande (Church of Saint Francis the Great), Ermita de San Antonio de la Florida (Saint Anthony's Chapel), Faro de Moncloa (viewing tower), Monasterio de las

Descalzas Reales (Convent of the Royal Barefoot Nuns), Monasterio de la Encarnación, Real Fábrica de Tapices (Royal Tapestry Factory), Museo Sorolla (Sorolla Art Museum), other art galleries and so on.

► **Nearby tourist attractions:** Alcalá de Henares (30 km from Madrid); Aranjuez (47 km from Madrid); Chinchón (45 km from Madrid); El Escorial (50 km from Madrid); Toledo (71 km from Madrid); Segovia (91 km from Madrid); Ávila (113 km from Madrid); and Cuenca (167 km from Madrid).

Madrid also has a large number of cinemas, theaters and shows. For information on current shows look in the newspapers or the *Guía del Ocio* (What's On Guide), available at newsstands.



2.2.7. USEFUL PHONE NUMBERS AND CONTACTS

ORGANISATION	CONTACT
Emergency Services of the Community of Madrid, Fire Service, National Police and Municipal Police	112
Information on General State Administration	060
Telephone Directory Service	11818
International Directory Service	11825
Civil Guard (Guardia Civil)	062
National Police	091
Municipal Police	092
Fire Service	080
Medical Emergencies (INSALUD – Spanish Health System)	061
Red Cross	91 522 22 22
After-hours Chemists/Pharmacies	010
Traffic Information.	900 123 505
Lost Property	91 527 95 90
Radio Taxi	91 547 82 00
Transport Information Service	91 580 19 80
Madrid-Barajas Airport	91 305 83 43/44/ 45/46
Train information – RENFE	902.24.02.02
EMT Buses	902 507 850
Madrid South Bus Station (Estación Sur de Autobuses)	914684202
Metro	902 444 403
Information service on embassies, from Monday to Friday from 9:00 am to 2:00 pm. Provides information on diplomatic representation in Spain and Spanish diplomatic representation abroad.	www.embajada-online.com 91 379 96 00

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