CÓDE	NAME OF MODULE	TYPE
	NANOTECHNOLOGY-ORIENTED RESEARCH ACTIVITIES	E

M = mandatory
E = elective

3.3.1. Learning goals of the module.

(List the specific learning goals that the current module should provide to the student; goals can focus on content, skills, or attitudes.)

This module intends to present the on going research activities in relation with nanoscience. In this way it is intended that the student will be in direct contact with the researchers of the surrounding and will know about a large number of potential industrial applications related with nanotechnologies.

3.3.2. Methodology: learning activities and credit value of the module (ECTS).

3.3.2.1. Learning activities.

(Time required to teach the module; links to other modules included in the MSc Program and suggested chronological sequence with the latter)

TOPICAL SEMINARS WILL BE GIVEN A RESEARCHERS IN CHARGE OF NANOTECHNOLOGY RELATED ACTIVITIES.

3.3.2.2. ECTS credit value (and time)

1 ECTS credit = 25 hours UPV/EHU

TYPE OF LECTURE[1]	Theory		Practice							Evaluation	
	M[2]	S	PA	PL	PO	TA	TAI	PCL	PCC	Periodic Grading	Final Grading

Classroom lectures		30									3
Personal work (3)		45									
TOTAL		75									3

(1) M (standard lecture); S (seminar); PA (practical exercises in classroom); PL (practical exercises in laboratory); PO (practical exercises with computers); TA (non-industrial workshops); TAI (industrial workshops); PCL (clinical practice); PCC (field practice); the acronyms are taken from the Spanish wording.

(2) M = maximum allowed is 60% of the full classroom lectures .

(3) Personal work = time that the student would use to prepare and develop individual and group assignments.

3.3.2.3. Module Program.
(*Lectures)*

Lecture 1	Presentation
Lecture 2	Surface-sensitive characterization techniques: Sensing the properties of biological structures
Lecture 3	Smart nanostructured surfaces for the investigation of biological processes
Lecture 4	Laser interference lithography techniques for nano/micro scale definition in materials
Lecture 5	4 Virus-based nanostructures
Lecture 6	Supercapacitors Alexander Bittner
Lecture 7	Optoelectronic and photovoltaic devices based in hybrid organic-inorganic materials
Lecture 8	Applications of nanoimprint lithography in biotechnology
Lecture 9	Near field microscopy: Nanoscale optical imaging throughout the spectrum
Lecture 10	Infrared nanospectroscopy
Lecture 11	Carbon-based spintronics
Lecture 12	Introduction to magnetism of confined Systems
Lecture 13	Nanoscale magnetic materials design
Lecture 14	Nanomedicine

Lecture 15	Organic-inorganic polymeric nanocomposites
Lecture 16	High performance nanostructured polymer Films
Lecture 17	Nanomaterials in advanced elechtrochemical devices
Lecture 18	ZnO nanowire arrays: multifunctional building blocks
Lecture 19	Size effects in plasticity
Lecture 20	Nanostructured and molecular materials for photovoltaic energy conversión
Lecture 21	Nanoscience for the construction industry: Numerical simulation of cement-based materials
Lecture 22	Nanostructured coatings for increasing wear resistance in tooling
Lecture 23	Carbon Nanotubes: Functionalization and applications
Lecture 24	Glyconanotechnology: Biofunctional nanotools with applications in diagnostics and therapeutics
Lecture 25	Nanophotonics

3.3.2.4. Bibliography.

(Basic and specialized bibliographies, journal references, internet addresses, etc.)

http://dipc.ehu.es/mscnano/intranet/NORA/

3.3.3. Criteria and methods for evaluation and grading

(Analysis of the methodology that will be used to evaluate the learning process of the student)

3.3.4. Learning resources

Students will have access to all bibliographic resources from the UPV/EHU Chemistry Faculty, the Centro de Física de Materiales CSIC-UPV/EHU, and the Donostia International Physics Center DIPC. Online access to the scientific literature from these centers will be also guaranteed.

3.3.5. Language and number of groups attending the module

1	NUMBER OF GROUPS
x	LANGUAGE: ENGLISH

3.3.6. Fields of science and technology to which the module is related

CODE	FIELD
	PHYSICS OF CONDENSED MATTER
	APPLIED PHYSICS

3.3.7. Department in charge of the Program

CODE	DEPARTMENT [1]
	DEPARTMENT OF MATERIALS PHYSICS

3.3.8. Teachers in charge of the module

DNI	Teacher UPV/EHU	Number of credits
	J.M. Pitarke	3

DNI	Teacher other institutions	Number of credits