CÓDE	NAME OF MODULE	TYPE
	SOFT MATTER AND NANOSTRUCTURED MATERIALS	M

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.)

INTRODUCTION OF GENERAL CONCEPTS IN SOFT MATTER:
- UNIVERSAL ASPECTS SHARED BY SOFT MATERIALS
- KINDS OF SOFT MATERIALS

DESCRIPTION OF SOFT MATTER CATEGORIES:
- COLLOIDS
- POLYMERS
- AMPHIPHILES
- LIQUID CRYSTALS
- BIOMOLECULES

BASIS FOR SELF-ASSEMBLY

NANOSTRUCTURED MATERIALS BASED ON SOFT SYSTEMS

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)

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	28										
Personal work (3)											
TOTAL											

(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 (2 hours)	PRESENTATION WHAT IS SOFT MATTER? GENERALITIES
Lecture 2 (2 hours)	WHAT IS SOFT MATTER? CLASSIFICATION: • POLYMERS • COLLOIDS • AMPHIPHILES • LIQUID CRYSTALS • BIOMOLECULES
Lecture 3 (4 hours)	BASIC UNIVERSAL CONCEPTS: • INTERMOLECULAR INTERACTIONS • STRUCTURAL ORGANIZATION • DYNAMICS • SCALING LAWS • POLYDISPERSITY AND DISTRIBUTIONS • VISCOELASTICITY • TIMESCALES
Lecture 4 (8 hours)	GENERAL PHENOMENA: • PHASE TRANSITIONS: LIQUID-LIQUID UNMIXING CRYSTALLIZATION • THE GLASS TRANSITION: PHENOMENOLOGY THEORIES • GELATION
Lecture 5 (4 hours)	POLYMERS • STATISTICAL DESCRIPTION OF POLYMER CHAINS • LARGE SCALE POLYMER DYNAMICS ROUSE DYNAMICS REPTATION
Lecture 6 (2 hours)	COLLOIDS
Lecture 7 (4 hours)	SELF-ASSEMBLY AND NANOSTRUCTURED MATERIALS • AMPHIPHILES • SELF-ASSEMBLY IN POLYMERS • CONFINEMENT EFFECTS IN NANOSTRUCTURED MATERIALS
Lecture 8 (2 hours)	SOFT MATTER IN NATURE

3.3.2.4. Bibliography.

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

SOFT CONDENSED MATTER
RICHARD A. L. JONES
OXFORD MASTER SERIES IN CONDENSED MATTER PHYSICS
OXFORD UNIVERSITY PRESS, 2002

INTRODUCTION TO SOFT MATTER. POLYMERS, COLLOIDS, AMPHIPHILES AND LIQUID CRYSTALS
IAN W. HAMLEY
JOHN WILEY & SONS, LTD
CHICHESTER, 2000

INTRODUCTION TO PHYSICAL POLYMER SCIENCE (3RD ED)
L. H. SPERLING
JOHN WILEY & SONS, LTD
NEW YORK, 2001

SOFT MATTER PHYSICS
M. DAOUD
AND C. E. WILLIAMS (EDS)
SPRINGER VERLAG
BERLIN, 1999

FRAGILE OBJECTS. SOFT MATTER, HARD SCIENCE, AND THE THRILL OF DISCOVERY
P. G. DE GENNES AND JACQUES BADOZ
SPRINGER VERLAG
NEW YORK, 1996

GIANT MOLECULES (2ND ED.)
A. YU. GROSBERG AND A. R. KHOKHLOV
ACADEMIC PRESS
SAN DIEGO, 1997

THE THEORY OF POLYMER DYNAMICS
M. DOI AND S. F. EDWARDS
CLARENDON PRESS
OXFORD, 1986

SOFT MATTER
VOLUME 1: POLYMER MELTS AND MIXTURES
G. GOMPPER AND M. SCHICK (EDS.)
WILEY-VCH, WEINHEIM, 2005

SOFT MATTER
VOLUME 2: COMPLEX COLLOIDAL SUSPENSIONS
G. GOMPPER AND M. SCHICK (EDS.)
WILEY-VCH, WEINHEIM, 2005

SOFT MATTER
VOLUME 3: COLLOIDAL ORDER: ENTROPIC AND SURFACE FORCES
G. GOMPPER AND M. SCHICK (EDS.)
WILEY-VCH, WEINHEIM, 2005

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)

FINAL WRITTEN EXAMINATION ABOUT THE CONCEPTS INTRODUCED

3.3.4. Learning resources

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
15.235.215-V	JUAN COLMENERO DE LEON	

DNI	Teacher other institutions	Number of credits
15.998.649-X	MARIA ARANZAZU ARBE MENDEZ	