CÓDE	NAME OF MODULE	TYPE
	FUNDAMENTALS OF SOLID STATE PHYSICS	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.)

THE GOLE OF THE MODULE IS TO DEVELOP A GENERALE PICTURE OF SOLID STATE PHYSICS THAT CAN BE USED BY STUDENTS TO UNDERSTAND THE CLASSIFICATION OF MATERIALS IN TERMS OF THEIR PROPERTIES: METALS, SEMICONDUCTORS, AND INSULATORS.
THIS INCLUDES GENERAL PROPERTIES OF CRYSTAL SYMMETRY: CRYSTAL LATTICE TRANSLATIONAL SYMMETRY AND POINT GROUP OPERATIONS, RECIPROCAL LATTICE, ONE PARTICLE PROPERTIES AND CLASSIFICATION OF ONE PARTICLE STATES IN TERMS OF WAVE VECTORS. IT ALSO INCLUDES BAND STRUCTURE OF METALS, SEMICONDUCTORES, AND INSULATORS; VIBRATIONS IN SOLIDS; EXPERIMENTAL AND THEORETICAL METHODS OF STUDY OF ELECTRONIC AND VIBRATIONAL PROPERTIES OF SOLIDS. MAGNETISM OF SOLIDS – WHY SOME MATERIALS ARE MAGNETIC?

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)

THE COURSE OF THE FUNDAMENTALS OF SOLID STATE PHYSICS WILL BE GIVEN IN THE FIRST FOUR-MONTH PERIOD OF A MASTER IN NANOSCIENCE. THIS IS BECAUSE A KNOWLEDGE OF BASIC NOTIONS AND PROPERTIES OF SOLIDS IS FUNDAMENTALS FOR UNDERSTANDING OF OTHER DISCIPLINES OF A MASTER IN NANOSCIENCE. THE THEMES OF THE COURSE FORM A BRIDGE THAT CONNECTS PHENOMENA OF EXDENDED MATERIALS AND NANO SIZE METALLIC. SEMICONDUCTOR AND INSULATOR SYSTEMS. IN PARTICULAR, INFORMATION OBTAINED IS NECESSARY FOR STUDY OF OTHER COURSES.

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											
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	GEOMETRICAL DESCRIPTION OF CRYSTALS: DIRECT AND RECIPROCAL LATTICES.
Lecture 2	**VIBRATIONS IN SOLIDS: PHONONS**
Lecture 3	"FREE" ELECTRONS IN SOLIDS.
Lecture 4	THE ELECTRONIC BANDSTRUCTURE OF SOLIDS: BLOCH THEOREM, THE NEARLY FREE-ELECTRON APPROXIMATION, THE THIGHT-BINDING APPROXIMATION.
Lecture 5	BAND STRUCTURE OF SELECTED METALS
Lectura 5	COHESION OF SOLIDS.
Lectura 6	**MAGNETISM IN SOLIDS: WHY SOME MATRERIOALS ARE MAGNETIC**

3.3.2.4. Bibliography.

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

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

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
	Eugene Chulkov	3

DNI	Teacher other institutions	Number of credits