Centre	**University College of Engineering of Vitoria-Gasteiz**
Name of subject	**26035 – Materials for the Microelectronics Industry**
Qualification	**Degree in Computer Management and Information Systems Engineering**
Type	**Elective**
Credits	**4.5 ECTS**
Year	**4**
Term(s)	**1st**
Department	**Mining and Metallurgical Engineering and Materials Science**
Language	**Spanish**

Outcomes / Objectives

1. Use subject-specific terminology correctly and use the appropriate verbal, mathematical and graphical language to express the fundamental basics of Materials Science.
2. Discern the main types of materials and be able to relate their main characteristics to their various applications in the field of Microelectronics.
3. Link the internal structure of materials to their specific physical-chemical and mechanical properties, determining the impact of those properties on the practical function of each material.
4. Work co-operatively in tasks in the field of Materials Science, approaching tasks as a team and analysing and discussing the ideas contributed by other team members.

Syllabus

Theoretical fundamentals. Arrangement of matter: atoms, interatomic bonds and structure of materials. Atomic diffusion. Mechanical, electrical and magnetic properties of materials. Theory of conductivity.

Conductive materials: conductors and superconductors. Resistors and electrical contacts. Semiconductor materials.

Dielectric and insulating materials.

Magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials.

Optical materials. Optical properties of materials. Stimulated emission of radiation (laser). Optical fibre.

Methodology

Teaching Method

Face-to-Face Teaching Hours								
Lectures	**Seminars**	**Classroom practice**	**Lab. practice**	**Computer sessions**	**Clinical practice**	**Workshops**	**Industrial workshops**	**Field practice**
30		**15**						
Student Hours of Non Face-To-Face Activities								
Lectures	**Seminars**	**Classroom practice**	**Lab. practice**	**Computer sessions**	**Clinical practice**	**Workshops**	**Industrial workshops**	**Field practice**
45		**22,5**						

Assessment System

General criteria

→Written essay exam

→Group assignments

Clarification regarding assessment

→FINAL GRADE: (Exam score)*0.80 + (Assignments score)*0.20

Compulsory materials

Course notes

Bibliography

Basic Bibliography

- Fundamentos de la Ciencia e Ingeniería de los Materiales. W.F. Smith (Ed. McGraw-Hill)
- Introducción e Ingeniería de los Materiales. W.D. Callister Jr. (Ed. Reverté)
- Ciencia de Materiales. Teoría - Ensayos - Tratamientos. P. Coca Rebollero, J. Rosique Jiménez (Ediciones Pirámide S.A.)
- Course notes.

In-depth Bibliography

- Materiales para Ingeniería. M.F. Ashby, D.R.H. Jones (Ed. Reverté)
- Materiales y componentes electrónicos pasivos. R. Alvarez Santos (Ed. Editesa)
- Materiales y componentes electrónicos activos. R. Alvarez Santos (Ed. Editesa)

Magazines

- Metalurgia y Electricidad
- Fundidores
- Plásticos universals
- Journal of Materials Science
- Materials Science and Engineering

Websites

- MATTER ¿ Materials Science & Engineering Educational Software: http://www.matter.org.uk
- MatWeb - Online Materials Information Resource: http://www.matweb.com
- ASM Handbook: http://products.asminternational.org/hbk/index.jsp