- Course title: **Electromagnetism, Quantum Physics and Optics**
- Course code: 5267
- Type of course: compulsory
- Level of course: basic
- Year of study: 1
- Semester: 2
- Number of credits allocated: 9
- Names of lecturers: Carmen Pereira and Ángel Ballesteros
- Objective of the course:
    - To understand the basic concepts and to describe the fundamental phenomena of Electromagnetism, Quantum Physics, Special Relativity and Optics.
    - To operate and to make appropriate use of the relevant laboratory instrumentation to perform experiments and measurements.
    - To apply such background in order to explain different phenomena and techniques that are relevant in Chemistry.
- Prerequisites: no prior requirements.
- Course contents:
    - Electric fields; electric potential; electric circuits; magnetic fields; motion of charged particles in magnetic fields; magnetic induction; maxwell equations: propagation and electromagnetic radiation; fundamentals of Quantum Mechanics; Schrödinger equation; wave function; angular momentum and spin; quantum statistics; relativistic mechanics; nuclear structure and nuclear processes; radioactivity; principles of optics; geometric optics; interferences and diffraction; polarization and dispersion; quantum properties of radiation.
- Recommended reading:
    - Francis W Sears, Mark W Zemansky, Hugh D Young, Roger A Freedman (2004) "Física universitaria", Volume 2, 11ª, Pearson Addison Wesley,
    - Paul A. Tipler, Gene Mosca (2005) "Física para la Ciencia y la Tecnología", Volumes 2A, 2B and 2C , 5th Ed., Reverté
    - Marcelo Alonso, Edward J Finn (1986) "Física, Volumen III: Fundamentos cuánticos y estadísticos", Addison-Wesley
    - Paul A. Tipler, Ralph A. Llewellyn (2003) "Modern Physics", 4th Ed., W.H. Freeman and Company
    - David Halliday, Robert Resnick (1966) " Physics" , John Wiley and Sons
    - Richard P. Feynman, (1971) " The Feynman Lectures on Physics: electromagnetism and matter (vol 2) and Quantum Mechanics (vol 3)", Fondo Educativo Iberoamericano
- Teaching methods:
    - Lectures: teachers explain the contents of the lessons.
    - Seminars: students and teacher discuss the problems and other points raised in class.
    - Practicals: students apply their knowledge to solve laboratory experiments.
- Assessment methods:
    - Continuous evaluation of theoretical sessions: 20%
    - Continuous evaluation of practical sessions: 20%
    - Group and individual analysis, presentation and discussion of problems: 10%
    - Written work and exams: 50%.
- Language of instruction: Spanish and/or English