- Course title: **Physical Chemistry I: Quantum Mechanics**.
- Course code: 5274
- Type of course: compulsory
- Level of course: fundamental
- Year of study: 2
- Semester: 1
- Number of credits allocated: 3
- Name of lecturer: Mª. José Tapia
- Objective of the course: The main aim of this course is to explain the structure of many-electron atoms and molecules using the principles of Quantum Mechanics.
- Prerequisites: It is recommended that students should have attended Mathematics I, Mathematics II and Electromagnetism Quantum Physics and Optics before following this course.
- Course contents: the origin and principles of Quantum Mechanic; a review of its applications to translational, vibrational and rotational motions and hydrogenic atoms; the techniques of approximation: variational principles and time-independent perturbation theory; the Slater determinant; the spectra of complex atoms and the molecular structure: the Born-Oppenheimer approximation; valence bond theory and molecular orbital theory are also studied.
- Recommended reading:
  - Atkins, P. W, (1998) 3. Physical Chemistry, Oxford Univ. Press
  - Atkins, P. W. and Friedman, R. S, (1996) 5. Molecular Quantum Mechanics, Oxford, Univ. Press,
  - Keith J. Laidler, John H. Meiser, Bryan C. Sanctuary, (2003) 6. Physical chemistry,
  - Benjamin Cummings.
  - Robert J. Silbey, Robert A. Alberty, Moungi G. Bawendi, (2005) 7. Physical Chemistry, John Wiley & Sons ,
  - Díaz, M. and Roig, A., (1975) 1. Química Física (vols. 1 and 2); Alhambra.
- Teaching methods:
  - Lectures: teachers explain the contents of the lessons.
  - Seminars: students and teacher discuss the problems and other points raised in class.
- Assessment methods:
  - Participation and attitude in lectures and seminars: 20 %
  - Resolution of problems, issues and other proposals: 20%
  - Written work and exams: 60 %
- Language of instruction: Spanish and/or English