

- Course title: **Mathematics I**
- Course code: 5264
- Type of course: compulsory
- Level of course: basic
- Year of study: 1
- Semester: 1
- Number of credits allocated: 6
- Names of lecturers: María Sagrario Sánchez and Tomás Pérez
- Objective of the course: The student will learn to apply scientific reasoning correctly. The student must interpret a chemical process from the properties of the (mathematical) functions that model it in a satisfactory manner.
- Prerequisites: no prior requirements.
- Course contents:
 - Real and vector models that depend on one or several real variables:
 - properties of the domain (open, closed, bounded, compact, connected)
 - properties of the model (continuous, differentiable, monotonic, extreme points)
 - the subsequent interpretation of the models in terms of the process being modelled
 - approximation using simpler models (Taylor expansion)
 - Numerical approximation (searching methods for roots of equations, minimum points, etc.)
 - Integral calculus
- Recommended reading:
 - H.G. Hecht (1990) *Mathematics in Chemistry. An Introduction to Modern Methods*, Prentice Hall, New Jersey.
 - E. Steiner (2005) *Matemáticas para las ciencias aplicadas*, Reverté, Barcelona.
 - J. Marsden, A. Weinstein (1993-1998) *Calculus* (3 vol.), Springer Verlag, New York.
 - J.F. Epperson (2007). *An introduction to numerical methods and analysis*, John Wiley & Sons, New York.
 - M. Valderrama (1995) *Modelos Matemáticos en las ciencias experimentales*, Pirámide, Madrid.
 - Enciclopedia de Matemáticas: <http://mathworld.wolfram.com/>
- 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 experiments in the computer room.
- Assessment methods:
 - Continuous evaluation of theoretical-practical sessions: 30%
 - Group and individual analysis, presentation and discussion of practices and problems: 10%
 - Written work and exams: 60%.
- Language of instruction: Spanish and/or English