

Numerical calculation and statistics

Introducing

Description

Numerical calculation:

- concept of loop, tracing of functions
- calculation of an integral by a numerical method (trapezoid, midpoint) writing of a generic solver.
- resolution of nonlinear equation systems: Newton's method.
- resolution of differential equations: explicit and implicit Euler method
- resolution of a system of differential equations: use of an EDO solver

Statistics

- one- and two-dimensional descriptive statistics
- principal component analysis
- the point estimate and by confidence intervals of the mean and variance in the Gaussian and non-Gaussian case
- tests on the mean, homogeneity and normality
- the principles of linear models and generalized linear models.

Objectives

Give students basic programming training
Learn numerical methods to solve the different classes of equations typical of their future field of specialty (Chemical and Biological Engineering)

Necessary prerequisites

Elementary notion of mathematical analysis: Matrix, vectors, scalar product
Basic notions of programming: loop, test, assignment, writing functions

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse