ANALYSE NUMÉRIQUE

NUMERICAL ANALYSIS

Lecturers: Laurent SEPPECHER, Grégory VIAL

| Lecturers : 12.0 | TC : 14 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

We will present basic numerical methods useful for engineering. Applications are given, which motivate the development of such methods, together with a systematic analysis of the accuracy.

Keywords : Approximation, linear systems, numerical integration, differential equations, optimisation.

Programme

- Linear systems, eigenvalues.
- Optimization, non-linear equation.
- Interpolation, numerical integration.
- Numerical approximation of ordinary differential equations.
- Discretization of linear partial differential equations.

Learning outcomes

- Identify the procedure of numerical simulation.
- Make a choice between different methods.
- Implement simple algorithms with Matlab.
- Combine several numerical methods.

Independent study

Objectifs : Learning basics, preparation of numerical simulations with Matlab.

Méhodes : Training exercises.

Core texts

A. QUARTERONI, R. SACCO, F. SALERI, *NUMERICAL MATHEMATICS*, Springer, 2006
J.RAPPAZ,M.PICASSO *INTRODUCTION À L'ANALYSE NUMÉRIQUE*, Presse polytecniques et universitaires romandes, 1998
G.ALLAIRE S.M. KABER*ALGÈBRE LINÉAIRE NUMÉRIQUE*, Ellipses, 2002

Assessment

valuation = 75% knowledge + 25% know-how (Knowledge = 100% final exam and know-how = 100% continuous assessment).