

Calcul formel et numérique

Lecturer

Maarten JANSEN (Coordinator)

Course mnemonic

INFO-F205

ECTS credits

5 credits

Language(s) of instruction

French

Course period

Second term

Course content

(1) Notion of model, numerical problem and algorithm, (2) numerical errors and computer representation of real numbers, (3) direct and iterative methods for linear systems, (4) solving nonlinear equations of one variable (5) interpolation (6) curve fitting (7) numerical solving of ordinary differential equations.

Objectives (and/or specific learning outcomes)

Study of numerical methods for problem solving in mathematical analysis and their application to real problems. Introduction to computer tools for numerical analysis (MATLAB). Introduction to the notion of numerical error and theoretical problems of stability and convergence of numerical algorithms.

Pre-requisites and co-requisites

Pre-requisites courses

INFO-F101 | Programmation | 10 crédits, MATH-F112 | Mathématiques 1 | 10 crédits and MATH-F114 | Algèbre linéaire et arithmétique | 5 crédits

Course having this one as pre-requisite

INFO-F305 | Modélisation et simulation | 5 crédits

Course having this one as co-requisite

INFO-F305 | Modélisation et simulation | 5 crédits

Teaching method and learning activities

Lectures, exercises and practical assignments. All the assignments involve practical work using the software package MATLAB.

References, bibliography and recommended reading

1) A. Quarteroni, R. Sacco, F. Saleri (2000) Méthodes numériques pour le calcul scientifique. SPRINGER VERLAG 2) Gerald Recktenwald. (2000) Numerical Methods with MATLAB: Implementations and Applications, Prentice Hall 3) L. V. Fausett (1999) Applied Numerical Analysis using MATLAB. Prentice Hall

Other information

Contact(s)

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Evaluation method(s)

Other

Evaluation method(s) (additional information)

Written exam, project in MATLAB

Programmes

Programmes proposing this course at the faculty of Sciences

BA-INFO | Bachelor in Computer science | unit 2 and BA-MATH | Bachelor in Mathematics | unit 2