

Numerical analysis

Multiphysical modelling

IDENTIFICATION

CODE : GEN-3-S2-EC-MOD
ECTS : 2.0

HOURS

Lectures : 1.0 h
Seminars : 24.0 h
Laboratory : 24.0 h
Project : 8.0 h
Teacher-student
contact : 57.0 h
Personal work : 12.0 h
Total : 69.0 h

ASSESSMENT METHOD

Reports of work sessions

TEACHING AIDS

Documents supplied on Moodle
Work sessions on computer

TEACHING LANGUAGE

French

CONTACT

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AIMS

basic numerical methods
their implementation on computer
knowledge of errors
Implement fundamental numerical methods
Explore various algorithms and their results

CONTENT

Matlab: introduction
Solution of linear systems
- direct methods: Gauss elimination/LU factorization
- iterative methods: Jacobi, Gauss-Seidel, SOR
Polynomial data-fitting by least-square method
- Elementary methods
- Advanced methods
Ordinary differential equations

BIBLIOGRAPHY

Lascaux P. et Théodor R., Analyse numérique matricielle appliquée à l'art de l'ingénieur, tomes I et II, Masson, 1986
Théodor R., Initiation à l'analyse numérique, Masson, 1986

PRE-REQUISITE

Root searching
- root locating
- search methods: Lagrange, Newton-Raphson, dichotomy
Numerical differencing and integration
Linear algebra & matrix analysis