

COURSE DETAIL

NUMERICAL APPROXIMATION OF MATHEMATICAL MODELS IN MECHANICS

Country

France

Host Institution

University of Bordeaux

Program(s)

University of Bordeaux

UCEAP Course Level

Upper Division

UCEAP Subject Area(s)

Mechanical Engineering

UCEAP Course Number

109

UCEAP Course Suffix**UCEAP Official Title**

NUMERICAL APPROXIMATION OF MATHEMATICAL MODELS IN MECHANICS

UCEAP Transcript Title

NUM APPR MATH MODEL

UCEAP Quarter Units

6.00

UCEAP Semester Units

4.00

Course Description

This course presents fundamental elements for the numerical approximation of mathematical models used in mechanics, particularly partial differential equations (PDEs). The focus is limited to linear diffusion and advection phenomena, which are common to many equations encountered in mechanics. Most of the course is devoted to the finite difference method for one-dimensional problems. Key concepts such as accuracy, stability, convergence, numerical diffusion, and numerical dispersion are studied in detail. Practical examples are used to illustrate these concepts, including the heat equation, pollutant advection in a river, and acoustic wave propagation.

Language(s) of Instruction

French

Host Institution Course Number

EMM6-ANUM1

Host Institution Course Title

APPROXIMATION NUMERIQUE DES EDP PAR DIFFERENCES FINIES

Host Institution Course Details

https://formation.bordeaux-inp.fr/plugins/odf-web/odf/_content/course-approxima...

Host Institution Campus

INP

Host Institution Faculty

Engineering

Host Institution Degree

Licence

Host Institution Department

Mechanical Engineering

Course Last Reviewed

2025-2026

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