Analyse numérique pour les équations aux dérivées partielles

Lecturer
Bernard KNAEPEN (Coordinator)

Course mnemonic
MATH-F3141

ECTS credits
5 credits

Language(s) of instruction
English and French

Course period
First term

Campus
Plaine

Course content

Introduction to numerical methods for the resolution of partial differential equations

1 Integration of ordinary differential equations

2 Differentiation by the method of finite differences

3 Resolution of partial differential équations

4 Iterative methods for the inversion of linear equations

5 Spectral methods: Fourier series and Chebyshev polynomials

Objectives (and/or specific learning outcomes)

> Formulate a numerical method for the resolution of partial differential equations

> Write a program in the Python language to solve a large range of problems described py partial differential equations

> Usage of programming tools including: jupyter notebook, numpy / scipy / matplotlib packages, git / github.

Pre-requisits and co-requisits

Pre-requisites courses

PHYS-F104 | Physique 1 | 10 crédits , PHYS-F104 | Physique 1 | 5 crédits and PHYS-F205 | Physique 2 | 5 crédits

Required knowledge and skills

Basic knowledge of a computer programming language.

Teaching method and learning activities

Classes with integrated practical exercises / flipped classes / personnal work.

Other information

Place(s) of teaching

Plaine

Contact(s)

Prof. B. Knaepen, bernard.knaepen@ulb.be

Programmes

Programmes proposing this course at the faculty of Sciences

BA-MATH | Bachelor in Mathematics | unit 3