UE Variational methods applied to modelling

Niveau d'étude
Bac +4

ECTS
6 crédits

Crédits ECTS Echange
6.0

Composante
UFR IM2AG (informatique, mathématiques et mathématiques appliquées)

Période de l'année
Printemps (janv. à avril/mai)

- **Langue(s) d'enseignement:** Anglais
- **Ouvert aux étudiants en échange:** Oui
- **Crédits ECTS Echange:** 6.0
- **Code d'export Apogée:** GBX8AM26

Présentation

Description

The aim of this course is to get deep knowledge of PDE modelling and their numerical resolution, in particular using variational methods such as the Finite Elements method.

Content

1. Introduction to modelling with examples.
2. Boundary problem in 1D, variational formulation, Sobolev spaces.
3. Stationary problem, elliptic equations.
4. Finite element method: algorithm, errors…
5. Evolution models, parabolic equations, splitting methods
6. Extensions and applications, FreeFEM++

This course include practical sessions.

Heures d'enseignement

CM	CM	16,5h
TD	TD	16,5h
TP	TP	16,5h

Pré-requis recommandés

notions of distribution theory, linear algebra, integral calculus, some notions of programming in some high level language, basic numerical analysis, as numerical integration of differential equations, basic notions on Hilbert spaces, usual partial differential operators (gradient, divergence, laplacian…)

Liste des enseignements

	Nature	CM	TD	TP	Crédits
Variational methods applied to modelling	MATIERE	16,5h	16,5h		
Variational methods applied to modelling complementary	MATIERE			16,5h	

Infos pratiques

Contacts

Responsable pédagogique

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Campus

Grenoble - Domaine universitaire