Modeling & Finite Elements

ECTS
3 crédits

Hourly volume
68h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

-How to model and to compute with the Finite Element Method (FEM) classical systems of PDEs.

At the end of this module, the student should be able to:

¿ write the weak (variational) form of the classical PDE models (with the corresponding energy minimization, symmetric case).
¿ Understand the mathematical analysis of classical PDE models.
¿ Model and compute with the FEM various classical phenomena (diffusive, convective, elasticity, etc.) which are ubiquitous in physics, process.
¿ Employ Finite Element libraries, e.g. Fenics (in Python)
¿ Implement advanced computational techniques in case of large-scale modeling (model reduction, coupling of numerical models and codes).

Necessary prerequisites

Fundamentals of PDE models, math. analysis,

Basic numerical methods-analysis.

Practical info

Location(s)

Toulouse