MÉTHODES NUMÉRIQUES EN MÉCANIQUE

NUMERICAL METHODS IN MECHANICS

Lecturers: **Jérôme BOUDET, Fabien GODEFERD, Olivier DESSOMBZ**

| Lecturers : 14.0 | TC : 14.0 | PW : 0.0 | Autonomy : 0.0 | Study : 4.0 | Project : 0.0 | Language : AN

Objectives

This course is an introduction to the numerical methods used in simulation software, in solid mechanics, fluid mechanics (CFD) and in energetics. The numerical methods allowing the resolution of boundary value problems in these disciplines are presented. The objective is to master the concepts required for a proper use of industrial software. A particular effort is devoted to the implementation and the physical interpretation, and interdisciplinarity allows for a better understanding of modellings and physical phenomena.

Keywords : numerical methods, finite volumes, weighted residuals, finite elements, solid mechanics, fluid mechanics

Programme	- Finite Differences - Solving methods and properties of numerical schemes - Finite Volumes - Variational methods - Spectral methods - Finite Elements (1/2) - Finite Elements (2/2)
Learning outcomes	• Being able to properly formulate a numerical model in mechanics • Being able to implement the basic numerical methods in mechanics • Being able to analyze and interpret numerical solutions
Independent study	Objectifs : Méhodes :
Core texts	C. Hirsch, *NUMERICAL COMPUTATION OF INTERNAL AND EXTERNAL FLOWS (VOLUMES 1 ET 2)*, John Wiley and Sons, 1988 H.K. Versteegh and W. Malalasekera *AN INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS*, Longman, 1995 J.C. Craveur*MODÉLISATION PAR ÉLÉMENTS FINIS : COURS ET EXERCICES CORRIGÉS*, Dunod, 2008
Assessment	Final mark = 60% Knowledge + 40% Know-how Knowledge mark = 100% final exam Know-how mark = 100% continuous assessment