

Faculty of Sciences

**PHY1371 Numerical Simulation in Physics**

[22.5h+30h exercises] 4 credits

This course is not taught in 2005-2006

This course is taught in the 2nd semester

Language: French

Level: First cycle

Aims

To offer to students the possibility to acquire a first experience in numerical simulation in the problems belonging to the physical sciences field. Since they must acquire experience, emphasis is put on computer exercises, that allow the confrontation to multiples problems brought up by the installation of a numerical simulation software and the necessity to completely resolve the problem - meaning without limiting oneself to throwing the bases of resolutions. The study of different methods of numerical simulation is mainly through several examples coming from diverse domains of physics.

Main themes

Initiation to numerical simulation in physics through two types of problems:

1. Differential equation resolution to partial derivatives by the method of finite differences or with the help of spectral methods ;
2. The numerical simulations of the Monte Carlo type.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites: basics in computer science. Knowledge of one programming language (C++, PASCAL or FORTRAN) and notions of operating system, preferably UNIX or LINUX. Basics in numerical analysis.