INMA2720 Computing techniques for applied mathematics

[30h+15h exercises] 4 credits

This course is taught in the 2nd semester

Teacher(s): Vincent Blondel, Etienne Huens
Language: French
Level: Second cycle

Aims

Give a broad outline of several computing techniques and tools needed for the design and the implementation of programs in the field of applied mathematics.

Main themes

Concepts ; Programming techniques ; Tools ; Technicals libraries

Content and teaching methods

1. Concepts :
- Memory management, dynamical allocation.
- Compilation option.
- Source code, object code, link editor, static and dynamics libraries.
- Difference between interpreted and compiled languages. Performance comparison.
2. Programming techniques :
- Pass by value and pass by address of arguments.
- Calls of librairies.
- Containers : list, map, ...
- Iterators.
- Modularisation and portability.
- Optimisation techniques.
3. Tools :
- CVS, Makefile, debugger and maintenance of documentation.
4. Technicals libraries :
- NTL, LEDA, CPLEX, Xpress, Blas, Boost, LAPACK, ... : presentation and use.
The choice are made according to the interest of the students.

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

The exercices are dedicated to a project. The subject is choosen by the students.
Prerequisite : knowledge of C++.

Other credits in programs

FSA13BA	Troisième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(4 credits)
MAP23	Troisième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(4 credits)