UCLouvain

linma2710

2022

Scientific computing

5.00 credits	30.0 h + 22.5 h	Q2

Teacher(s)	Absil Pierre-Antoine ;Meerbergen Karl (compensates Papavasiliou Anthony) ;Papavasiliou Anthony ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Basic training in numerical methods and programming (level of LEPL1104).
Main themes	• Numerical software in C++ and Python • Parallel computing • Numerical methods for partial differential equations
Learning outcomes	**At the end of this learning unit, the student is able to :** Contribution of the course to the program objectives (Nr) : • AA1.1, AA1.2, AA1.3 • AA2.2, AA2.3, AA2.4 • AA3.2 • AA6.1, AA6.3 After successful completion of this course, the student will be able to: 1 • Write, modify and use numerical software in C++ and Python; • Write, modify and use scientific software for partial differential equations; • Employ parallel programming techniques Transversal learning outcomes : • Use a reference book in English; • Use programming languages for scientific computing; • Release software along with suitable user documentation.
Evaluation methods	• Work carried out during the term: homework assignments, exercises, or laboratory work. These activities are thus organized (and evaluated) only once per academic year. • Exam: written, or sometimes oral depending on the circumstances. The final grade is min(1/2 D + 1/2 E, D+5, E+5), where D is the grade of the work carried out during the term and E is the grade of the exam. Further information is provided in the "Course outline" document available on Moodle (see "Online resources" below).
Teaching methods	• Interactive lectures • Homework assignments, exercises, or laboratory work under the supervision of the teaching assistants
Content	• Programming concepts in C++ and Python • Numerical software engineering in C++ and Python • Analysis of partial differential equations • Numerical methods for partial differential equations • Introduction to parallel computing using MPI • Other topics related to the course themes.
Inline resources	https://moodle.uclouvain.be/course/view.php?id=2951
Bibliography	• Textbook • Complementary documents posted on Moodle Further information is provided in the "Course outline" document available on Moodle.
Other infos	The organisation details are given every year in the course outline.

Faculty or entity in charge	MAP

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Computer Science and Engineering	INFO2M	5		
Master [120] in Computer Science	SINF2M	5		
Master [120] in Mathematical Engineering	MAP2M	5		