UCLouvain

linma2360

2023

Project in mathematical engineering

5.00 credits	30.0 h + 22.5 h	Q1 and Q2

Teacher(s)	Absil Pierre-Antoine ;Jacques Laurent ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Depending on the selected topics, this course may require the use, extension or acquisition of advanced concepts in applied mathematics (such as those appearing in the program of the Master in Mathematical Engineering).
Main themes	Topics covered in this course are related to the application of applied mathematics disciplines taught at UCL, and vary from year to year. Those applications come from the industrial or organizational worlds.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 Learning outcomes: - LO1.1, LO1.2, LO1.3 - LO2.1, LO2.2, LO2.3, LO2.4, LO2.5 - LO3.1, LO3.2, LO3.3 - LO4.1, LO4.2, LO4.3, LO4.4 - LO5.1, LO5.2, LO5.3,LO5.4, LO5.5, LO5.6 - LO6.1, LO6.3 (the acquisition of certain LOs depending on the type of project carried out) More specifically, at the end of the course, the student will be able to : • develop within a small group an application of mathematical engineering, proposed by an external partner (company, research center or institution) or inspired by a practical problem from the industrial or organizational worlds • apply in a multidisciplinary way the theoretical and methodological skills acquired during his/her training in applied mathematics (e.g. in the fields of optimization, numerical analysis, algorithms, discrete mathematics, dynamical systems, etc.) • acquire and apply new knowledge and advanced skills in applied mathematics related to the selected application (from the scientific literature, reference books, interviews with experts in the field, etc.) Transversal learning outcomes : • conduct a group project (reformulate objectives, schedule and allocate tasks, communicate effectively within a group, maintain communication with the project sponsor, take decisions as a team and manage interpersonal relationships) • write and validate specifications, define a schedule, design, implement and test a solution (usually algorithmic or computational), and validate it on real data • communicate orally about a technical solution • write a convincing report recommending a technical solution
Evaluation methods	Evaluation will take into account • specifications defined at the beginning of the project • amount and quality of work performed, and suitabilty of the recommended technical solution • a final written report about the project • oral presentation • feedback from the supervisor and, if appropriate, the external partner.
Teaching methods	Students work in groups on a project selected among a list of potential projects presented at the beginning of the academic year. A supervisor monitors the progress of each group on a regular basis.
Content	No specific content. Recent project topics include "Image restoration", "Optimal Economic Dispatch of Power Generating Units", "An intelligent smartphone keyboard", "Fighting fires in Siberia", "Modelling the energy market", "Location of a sensor network and measure aggregation", "Optimal robust design of mechanical structures".
Inline resources	https://moodle.uclouvain.be/course/view.php?id=1657

Faculty or entity in charge	MAP

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Mathematical Engineering	MAP2M	5		🔍
Master [120] in Data Science Engineering	DATE2M	5		🔍
Master [120] in Data Science: Information Technology	DATI2M	5		🔍