UCLouvain

lsinc1112

2022

Algebra

5.00 credits	30.0 h + 30.0 h	Q2

This learning unit is not open to incoming exchange students!

Teacher(s)	Guérit Stéphanie ;Nunes Grapiglia Geovani ;
Language :	French
Place of the course	Charleroi
Prerequisites	This course assumes that you have acquired the skills of the end of secondary school allowing you to translate a problem into a system of equations with several variables and to solve it.
Main themes	The course emphasizes: • the understanding of mathematical tools and techniques based on a rigorous learning of the concepts favored by the highlighting of their concrete application, • the rigorous manipulation of these tools and techniques within the framework of concrete applications. Subjects covered: Matrix calculation Solving Systems of Linear Equations Linear algebra
Learning outcomes	**At the end of this learning unit, the student is able to :** With regard to the AA reference system of the "Bachelor in Computer Science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: S1.G1 S2.2 S1.G1 Students who successfully complete this course will be able to: S2.2 • Model concrete problems using matrices and vectors; • Solve concrete problems using matrix calculation techniques (in particular the resolution of linear systems); • Reasoning by correctly manipulating mathematical notations and methods keeping in mind but going beyond a more intuitive interpretation of concepts.
Evaluation methods	Students are assessed individually during a written exam on the basis of the learning outcomes announced above. In addition, homework results will be incorporated into the final grade as a bonus. The exact terms and conditions will be specified during the course.
Teaching methods	Lectures and exercise-based learning activities (APE). Online assignments will also be offered. The course and the learning activities through exercises will favor interactions between teachers and students. Some of the above activities (lessons, APE, APP) can be organized remotely.
Content	The course emphasizes: • the understanding of mathematical tools and techniques based on a rigorous learning of the concepts favored by the highlighting of their concrete application, • the rigorous manipulation of these tools and techniques within the framework of concrete applications. The concepts covered in the course are described below. Matrix calculation • Matrix operations • Inversion • Determining Solving Systems of Linear Equations • Matrix writing of a system of linear equations • Basic Row Operations • Gauss-Jordan elimination

	• LU factorization • Implementation of algorithms for solving systems of linear equations Linear algebra • Vectors, operations on vectors • Vector spaces (vector, independence, basis, dimension) • Linear maps (maps to plane, kernel and image transformations) • Eigenvectors and eigenvalues (including maps) • Dot products and orthogonal projections
Faculty or entity in charge	SINC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5		🔍