Q2



2024

5.00 credits

linfo1112

30.0 h + 30.0 h

Teacher(s)	Craeye Christophe ;Vitale Enrico ;					
Language :	French					
Place of the course	Louvain-la-Neuve					
Prerequisites	This course assumes that the student already masters the skills of end of secondary allowing to translate a problem into a system of equations with several variables and to solve it.					
Main themes	 The course focuses on : the understanding of mathematical tools and techniques based on a rigorous learning of concepts favored by highlighting their concrete application, the rigorous manipulation of these tools and techniques in the context of concrete applications. 					
	Matrix calculation • transposition, • operation on matrices, • rank and resolution of a linear system, • inversion, • determinant					
	Resolution of linear equation systems • Matrix writing of a system of linear equations • Basic operations on the lines • Elimination of Gauss-Jordan • LU Factoring • Implementation of Linear Equation System Resolution Algorithms Linear algebra • vectors, vector operations,					
	 vector spaces (vector, independence, base, dimension), linear applications (applications to transformations of the plan, kernel and image), eigenvectors and eigenvalues (including applications) 					
Learning outcomes	At the end of this learning unit, the student is able to : Given the learning outcomes of the "Bachelor in Computer science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • \$1.G1 • \$2.2 1 Students who have successfully completed this course will be able to: • Model concrete problems using matrices and vectors; • Solve concrete problems using matrix calculation techniques (in particular the resolution of linear systems); • Reason using correctly the mathematical notation and methods keeping in mind but exceeding a more intuitive understanding of the concepts.					
Evaluation methods	Written exam and implementation assignments carried out during the semester (approximately 15% of the mark).					
Teaching methods	The course is given in the form of lectures and practical work sessions. The implementation assignments are supervised by the course assistants. A partial, optional but dispensatory questioning takes place halfway through.					
Content	Matrix calculation transposition, matrix operation, rank, resolution of a linear system, 					

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inversion,
determining

	Solving Systems of Linear Equations				
	 Matrix writing of a system of linear equations Basic row operations Gauss-Jordan elimination Orthogonality and QR factorization Implementation in Python language of algorithms for solving systems of linear equations 				
	Linear algebra vectors, operations on vectors, vector spaces (vector, independence, basis, dimension), Euclidean space, linear applications (applications to plane, kernel and image transformations), eigenvectors and eigenvalues (including maps) 				
Faculty or entity in charge	INFO				

Programmes containing this learning unit (UE)							
Program title	Acronym	Credits	Prerequisite	Learning outcomes			
Bachelor in Computer Science	SINF1BA	5		٩			