Linear algebra

ECTS : 3

Langue du cours : Français

Volume horaire : 18

Description du contenu de l'enseignement :

To provide a working understanding of matrices and vector spaces for later modules to build on and to teach students practical techniques and algorithms for fundamental matrix operations and solving linear equations.

Compétences à acquérir :

By the end of this module, students will have demonstrated:**Knowledge**

1. The understanding algebraic and geometric representations of vectors in R^n and their operations
2. The ability to define a linear combinaision, a dependant, independent and spanning set of vectors
3. The ability to define subspace of a vector space, recognize and use basic properties of subspaces and vector spaces
4. The ability to recognize echelon forms, to identify the number of pivots and to interprete the result
5. The ability to define the size of a matrix, the inverse of a matrix, the transpose of a matrix
6. The ability to provide a definition of the determinant and describe its properties (including the determinant of the inverse, the transpose, the determinant of a product, the determinant of an upper/lower triangular matrix)
7. The ability to describe how performing row operations affects the determinant
8. The ability to recognise a basis of the vector space Rn and describe coordinates of a vector relative to a given basis
9. The ability to define the Image and the Kernel of a vector space and state the rank-nullity theorem
10. The ability to define, give examples, and properties of the eigenvectors and eigenvalues

Skills

1. The ability to determine whether or not particular subsets of a vector space are subspaces
2. The ability to perform row operations on a matrix and solve systems of linear equations using Gauss-Jordan elimination to reduce to echelon form
3. The ability to perform common matrix operations such as addition, scalar multiplication, multiplication (when possible), and transposition

Values and Attitudes

1. Ability to articulate deductive reasoning
2. Rigor in reasoning and notation

Coefficient : 1.00