Overview of COMP1046 Mathematics for Computer Scientists 2020/21

Lecture 1: Generalities: not used in COMP1046 (*used on UK campus*).

Lecture 2: Matrices
- Numeric vectors
- Matrices
- Matrix operations

Lecture 3: Determinants and Matrix Inversion
- Introduction
- Adjugate Matrix
- Determinants
- Invertible Matrices

Tutorial 1: Matrices

Lecture 4: Linear Dependency and Rank
- Linear dependency
- Rank of a matrix

Lecture 5: Systems of Linear Equations
- Definition of a System of Linear Equations
- Cramer's Method
- Rouchè-Capelli Theorem
- Gaussian Elimination
- Summary of Methods

Tutorial 2: Systems of Linear Equations

Lecture 6: Vector Spaces
- Vector Spaces
- Linear Dependence
- Linear Span

Lecture 7: Basis and Dimension of Vector Spaces
- Basis of a Vector Space
- Dimension of a Vector Space

Tutorial 3: Vector Space Models

Lecture 8: Linear Mappings Part 1
- Mappings
- Linear Mappings
- Linear Mappings and Vector Spaces

Lecture 9: Linear Mappings Part 2

- Endomorphisms and Kernel
- Rank and Nullity of Linear Mappings

Tutorial 4: Linear Mappings

Lecture 10: Geometric Mappings

- Matrix Representation of Linear Mapping
- Geometric Mappings

Tutorial 5: Geometric Mappings

Lecture 11: Eigenvalues and Eigenvectors

- Eigenvalues and Eigenvectors
- Eigenspaces
- Determining Eigenvalues and Eigenvectors

Tutorial 6: Eigenvalues and Eigenvectors

Lecture 12: Calculus and Optimization

- Maxima and Minima
- Optimization
- Gradient Descent

Tutorial 7: Optimization