

MTH207e Linear Algebra

Level: 2

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

E-Learning: BLENDED - Learning is done MAINLY online using interactive study materials in Canvas. Students receive guidance and support from online instructors via discussion forums and emails. This is supplemented with SOME face-to-face sessions. If the course has an exam component, this will be administered on-campus.

Synopsis:

MTH207 introduces essentials of linear algebra and shows the relationships between them. As linear algebra uses linear transformations to study systems of linear equations, students should have a sound knowledge of mathematics, as developed in Further Discrete Mathematics and Further Calculus and Algebra.

Topics:

- Evaluate determinants by row or column expansions.
- List and use properties of determinants.
- Define systems of linear equations and the nature of their solutions.
- Solve linear systems by Gaussian Elimination and Gauss-Jordan methods.
- Define and list properties of Linear Transformations.
- Perform matrix algebra.
- Define general vector space V .
- Define basis and dimension of V .
- Find row space, Column space and Null space of an $m \times n$ matrix.
- Find rank and nullity of a matrix.
- Orthogonality.
- Eigenvalues and Eigenvectors.

Textbooks:

Gilbert Strang: Linear Algebra and Its Applications 4th edition Thomson Brooks/Cole
ISBN-13: 9780030105678-AA

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ISBN-13: 9780030105678

Learning Outcome:

- Show how to prove a mathematical statement in linear algebra.
- Calculate the determinant, eigenvalues and/or eigenvectors of a square matrix.
- Determine whether given subsets are linearly independent or are spanning sets of given subspaces.
- Compute row echelon form, row space, column space, null space or rank of a given matrix.
- Apply the Gram-Schmidt process to obtain an orthonormal basis for a given inner product space.
- Solve system of linear equations.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
COMPUTER MARKED ASSIGNMENT	8
TUTOR-MARKED ASSIGNMENT	16
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**