

MTH319 Mathematical Methods I

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

MTH319 Mathematical Methods I will introduce students to the mathematical foundations for solutions to engineering problems. The course will be driven from the engineering systems perspective and expose students to methodology to identify appropriate simplifications in system modelling that lead to simplified mathematical description from a more comprehensive one.

Topics:

- Linear Systems of Equations
- Gaussian Elimination
- Linear Independence
- Rank of a Matrix
- Vector Space
- Determinants
- Inverse of a Matrix
- Eigenvalues and Eigenvectors
- Modelling and first order differential equations
- Modelling and second order differential equations
- Linear systems of differential equations
- Stability and linear classification

Textbooks:

Erwin Kreyszig: Advanced Engineering Mathematics 10 Wiley
ISBN-10: 978-0-470-

Learning Outcome:

- Determine the solutions of an initial value problem.
- Show the validity of given mathematical statements.
- Calculate a basis of a given subspace.
- Solve system of linear equations or differential equations.
- Compute the eigenvalues and eigenvectors of a given square matrix.
- Sketch solutions of a given differential equation.

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	70
Total		100