ENGINEERING MATHEMATICS

Subject Aim:
The subject is intended to:
The subject aims to introduce students with some fundamental mathematical concepts. The emphasis will be on application of mathematical methods to solving practical problems in the construction industry.

Learning Outcomes:

Students will demonstrate their ability to:-

1. apply knowledge of Vector Calculus to solve problems in Engineering Mathematics;
2. apply knowledge of Linear Algebra to solve problems in Engineering Mathematics;
3. apply algorithms to solve for simple Linear Programming problems;
4. apply the idea of partial derivatives and Lagrange Multiplier to solve for constrained optimization problems;

Syllabus Content:

Linear Algebra:
Matrices and determinants; Vectors; Systems of linear equations; General properties of solutions; Elimination methods; Ill-conditioned systems; Eigenvalues and eigenvectors; Applications.

Functions of several variables:
Partial derivatives; Maxima, minima and saddle points; Lagrange multiplier; Application to error estimates.

Linear Programming:
Formulation; Graphical solution; Simplex method; Parametric modeling.

Learning and Teaching Approach:
The lectures aim to provide students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. To develop students’ ability for logical thinking and effective communication. Tutorial and presentation sessions will be held.

Assessment:
To pass this subject, students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components.

Reading List:

Recommended: