ENGINEERING MATHEMATICS (M3)

(Second Year of Electronics / E & Tc Engineering)

About M3:

This is also application based and has different syllabus for different branches. The learning methodology includes lots and lots of practice of the concepts. To equip students with techniques to understand the advance level mathematics and its application that would enhance analytical thinking in their core area.

Examination Scheme

In-Semester Exam :30 Marks

End-Semester Exam :70 Marks

Team Work (TW) :25 Marks

Course Contents:

Unit I: Linear Differential Equations (LDE) and Applications

LDE of nth order with constant coefficients, Complementary Function, Particular Integral, General method, Short methods, Method of variation of parameters, Cauchy's and Legendre's DE, Simultaneous and Symmetric simultaneous DE. Modeling of Electrical circuits.

Unit II: Transforms

Fourier Transform (FT): Complex exponential form of Fourier series, Fourier integral theorem, Fourier Sine & Cosine integrals, Fourier transform, Fourier Sine and Cosine transforms and their inverses. Z - Transform (ZT): Introduction, Definition, Standard properties, ZT of standard sequences and their inverses. Solution of difference equations.

Unit III: Numerical Methods

Interpolation: Finite Differences, Newton's and Lagrange's Interpolation formulae, Numerical Differentiation. Numerical Integration: Trapezoidal and Simpson's rules, Bound of truncation error, Solution of Ordinary differential equations: Euler's, Modified Euler's, Runge-Kutta 4th order methods and Predictor-Corrector methods.

Unit IV: Vector Differential Calculus

Physical interpretation of Vector differentiation, Vector differential operator, Gradient, Divergence and Curl, Directional derivative, Solenoidal, Irrotational and Conservative fields, Scalar potential, Vector identities.

Unit V: Vector Integral Calculus & Applications

Line, Surface and Volume integrals, Work-done, Green's Lemma, Gauss's Divergence theorem, Stoke's theorem. Applications to problems in Electro-magnetic fields.

Unit: VI Complex Variables

Functions of a Complex variable, Analytic functions, Cauchy-Riemann equations, Conformal mapping, Bilinear transformation, Cauchy's integral theorem, Cauchy's integral formula and Residue theorem.