UNIVERSITY OF KERALA

B-TECH DEGREE COURSE

FIRST AND SECOND SEMSESTER

REVISED SYLLABUS
2008 ONWARDS

08-101 Engineering Mathematics -1

L-T-P:2-1-0 credits:6

MODULE - 1

Application of differentiation:- Definition of Hyperbolic functions and their derivatives – successive differentiation – Leibniz theorem (with out proof) – curvature – Radius of curvature – center of curvature -evolute (Cartesian,polar and parametric forms)

partial differentiation and applications:- partial derivatives -Euler's theorem on homogeneous functions – Total derivatives – Jacobian's – errors and approximation – Taylors series (one and two variables) -Maxi ma and Mini ma of functions of two variables – lag ranges method – Leibniz rule on differentiation under integral sign.

Vector differentiation and applications:- Scalar and vector functions – differentiation of vector functions -Velocity and acceleration – scalar and vector fields – Operator – gradient – physical interpretation of gradient – Directional derivative – Divergence – curl – Identities involving (no proof) -Ir rotational and solenoid fields -Scalar potential.

MODULE - 2

Laplace transforms:- Transforms of elementary functions – shifting property -inverse transforms – Transforms of derivatives of derivatives and integrals -Transform functions multiplied by t and t -Convolution theorem(with out proof) – transforms of unit step function,unit impulse function and periodic functions – second shifting theorem – solution of ordinary differential equations with constant coefficients using Laplace transforms.

Differential equations and applications:- Linear differential equations with constant coefficients –

Method of variation of parameters-Cauchy and Legendre equations -Simultaneous linear equations with constant coefficients-Application to orthogonal trajectories(Cartesian form only).

MODULE - 3

Matrices :- rank of a matrix – Elementary transformations –Equivalent matrices- inverse of a matrix by gauss – Jordan method – Echelon form and normal form -linear dependence and independence and dependence of vectors- Consistency-solution of a system linear equations -Non homogeneous and homogeneous equations – Eugen values and Eugen vectors -Properties of Eugen values and Eugen vectors -clayey Hamilton theorem (no proof) – Diagonalisation – Quadratic forms – Reduction to canonical forms – Nature of quadratic forms – Definiteness,rank,signature and index.

REFERENCES

1. **Kreyszig; Advanced engineering mathematics,8th edition,Wiley eastern.**
2. **Peter o Neil ;Advanced engineering mathematics,Thomson .**
3. **B.S Grewal;Higher engineering mathematics,Khanna publishers.**
4. **B.V Ramana; Higher engineering mathematics,Tata McGraw Hill,2006.**
5. **Michel D Greenberg ;Advanced engineering mathematics,Pearson International.**
6. **Sureshan j. Nazarudeen and Royson ;Engineering mathematics I,Zenith publications.**