SUBJECT NO-MA51004, SUBJECT NAME- Integral Equations and Variational Methods

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Prerequisite: void

Integral Equations: Basic concepts, Volterra integral equations, relationship between linear differential equations and Volterra equations, resolvent kernel, method of successive approximations, convolution type equations, Volterra equation of the first kind. Abel s integral equation. Fredholm integral equations, Fredholm equations of the second kind, the method of Fredholm determinants, iterated kernels, integral equations with degenerate kernels, eigen values and eigen functions of a Fredholm alternative, construction of Green s function for BVP, singular integral equations.

Calculus of Variations: Euler – Lagrange equations, degenerate Euler equations, Natural boundary conditions, transversality conditions, simple applications of variational principle, sufficient conditions for extremum. Variational formulation of BVP, minimum of quadratic functional. Approximate methods – Galerkin’s method, weighted-residual methods, Colloation methods. Variational methods for time dependent problems.