(A) Numerical Analysis

(w.e.f. academic year 2019-20 batch onwards)

DSE-VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be made to undefirstand some methods of numerical analysis.
Outcome: Students realize the importance of the subject in solving some problems of algebra and calculus.

Unit- I

Errors in Numerical Calculations - Solutions of Equations in One Variable: The Bisection Method - The Iteration Method - The Method of False Position-Newton's Method - Muller's Method - solution of Systems of Nonlinear Equations.

Unit- II

Interpolation and Polynomial Approximation: Interpolation - Finite Differences - Differences of Polynomials - Newton's formula for Interpolation - Gauss's central differences formulae - Stirling's and Bessel's formula - Lagrange's Interpolation Polynomial - Divided differences - Newton's General Interpolation formula - Inverse Interpolation.

Unit- III

Curve Fitting: Least Square Curve Fitting: Fitting a Straight Line-Nonlinear Curve Fitting.
Numerical Differentiation and Integration: Numerical Differentiation - Numerical Integration: Trapezoidal Rule-Simpson's 1/3rd-Rule and Simpson's 3/8th-Rule - Boole's and Weddle's Rule - Newton's Cotes Integration Formulae.

Unit- IV

Numerical Solutions of Ordinary Differential Equations: Taylor's Series Method - Picard's Method - Euler's Methods - Runge Kutta Methods.

Text:

S.S.Sastry,Introductory Methods of Numerical Analysis, PHI

References:

1] Richard L. Burden and J. Douglas Faires,Numerical Analysis (9e)

2] M K Jain, S R K Iyengar and R K Jain, Numerical Methods for Scientific and Engineering computation

3] B.Bradie , A Friendly introduction to Numerical Analysis

(B) Integral Transforms

(w.e.f. academic year 2019-20 batch onwards)

DSE - VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be exposed to Integral Transforms. The students also learning the Applications of Laplace Transforms to Differential Equations which arises in Physics and Engineering Problems.

Outcome: Students apply their knowledge to solve some problems on special functions and Differential Equations by using the Integral Transforms.

Unit- I

Laplace Transforms-Definition-Existence theorem-Laplace transforms of derivatives and integrals Periodic functions and some special functions.

Unit- II

Inverse Transformations - Convolution theorem - Heaviside's expansion formula.

Unit- III

Applications to ordinary Differential equations - solutions of simultaneous ordinary Differential equations - Applications to Partial Differential equations.

Unit- IV

Fourier Transforms- Sine and cosine transforms-Inverse Fourier Transforms.

Text:

Vasishtha and Gupta, Integral Transforms, Krishna Prakashan Media(P), Ltd, Meerut (2e)

(C) Analytical Solid Geometry

(w.e.f. academic year 2019-20 batch onwards)

DSE - VI

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students learn to describe some of the surfaces by using analytical geometry.
Outcome: Students understand the beautiful interplay between algebra and geometry.

Unit- I

Sphere: Definition-The Sphere Through Four Given Points-Equations of a Circle- Intersection of a Sphere and a Line-Equation of a Tangent Plane-Angle of Intersection of Two Spheres-Radical Plane.

Unit- II

Cones and Cylinders: Definition-Condition that the General Equation of second degree Represents a Cone-Cone and a Plane through its Vertex -Intersection of a Line with a Cone.

Unit- III

The Right Circular Cone-The Cylinder- The Right Circular Cylinder.

Unit- IV

The Conicoid: The General Equation of the Second Degree-Intersection of Line with a Conicoid-Plane of contact-Enveloping Cone and Cylinder.

Text:

Shanti Narayan and P K Mittal, Analytical Solid Geometry (17e)

References:

1] Khaleel Ahmed, Analytical Solid Geometry

2] S L Loney , Solid Geometry

3] Smith and Minton, Calculus