

## Brief Summary of subject syllabus

### **Functional Analysis:**

**Teacher name:** Dr. Madiha Rashid

**Book name:** Introductory functional analysis by Erwin Kreyzing

**Syllabus Outline:** Metric space, Convergent and Cauchy sequence, Complete metric space, Continuous function, Open and closed sets, Norm space, Banach space, Equivalent norms, Compact space, Linear functional, Linear operator

### **Numerical Analysis:**

**Teacher name:** Dr. Akbar

**Book name:** Elementary numerical analysis by S.D Corte and C Boor.

#### **Syllabus Outline:**

Lagrange interpolation formula

Newton forward/backward interpolation

Bessel's interpolation

Numerical integration:

- Trapezoidal rule
- Simpson (1/3) and (3/8) rule
- Bool's rule

Solution of non-linear equation

- Bisection method
- Secant method
- Newton Raphson method
- Fixed Point Iteration

Solution of linear equation

- Gauss's elimination method
- LU decomposition
- Jacobi method
- Gauss Seidel iterative method
- Residuals

### **Fluid Mechanics:**

**Teacher name:** Dr. Rabia

**Syllabus Outline:** Units and dimensions, Viscosity, Classification of fluids , Types of flow, Basic hydrostatic equation, Continuity equation, Types of fluid motion, Euler's equation of motion, Bernoulli's equation, Navier-stokes equation

### **Partial Differential Equations:**

**Teacher name:** Dr. Khadija Maqbool

**Book name:** Introduction to partial differential equation by K. Sankara Rao

**Syllabus Outline:** Classification of first and second order partial differential equation

Canonical form of second order partial differential equation, Types of boundary conditions, Heat equation, Wave equation, Laplace equation, Laplace transform, Inverse Laplace transform, Fourier transform

### **Statistics:**

**Teacher name:** Dr. Asma

**Book name:** introduction to statistical theory by Sher Muhammad Chaudhary

**Syllabus Outline:** Probability, Measures of central tendency, Measures of variation, Permutations, Combination, Baye's theorem, Skewness, Probability mass function, Probability density function, Joint Distribution