1. **Root Finding Roots of Polynomials**
   1. Bisection Method
   2. Newton-Raphson Method
   3. Secant Method
   4. False-Position Method
   5. Fixed-Point Iteration
      1. Aiken’s Δ² Process
      2. Order of Convergence
   6. Muller’s Method
   7. Bairstow’s Method
2. **Interpolation**
   1. Lagrange Polynomial Interpolation (Practical)
   2. Errors in Interpolation (Practical)
   3. Divided Difference Interpolation (Practical)
   4. Interpolation with Equally Spaced Points (Practical)
   5. Cubic Spline Interpolation (Practical)
3. **Numerical Differentiation**
   1. Numerical Differentiation (Practical)
   2. Derivatives from Difference Table (Practical)
   3. Derivative Formula Using Lagrange's Interpolation (Practical)
   4. Richardson’s Extrapolation (Practical)
   5. Five-Point Formula for Derivatives (Practical)
4. **Numerical Integration**
   1. Trapezoidal Rule for Numerical Integration (Practical)
   2. Simpson’s Rule for Numerical Integration (Practical)
   3. Round-off Error in Trapezoidal and Simpson’s Rules (Practical)
   4. Adaptive Quadrature Method (Practical)
   5. Gaussian Quadrature (Practical)
5. **Numerical solution of system of linear equation:**
   1. Backsubstitution Method
   2. Forward Substitution Method
   3. Gaussian Elimination (Practical)
   4. Pivoting Strategies (Practical)
   5. Matrix Factorization (Practical)
   6. Crout’s and Cholesky Factorization (Practical)
   7. Solving Tridiagonal Systems (Practical)
   8. Jacobi Method (Practical)
   9. Gauss-Seidel Method (Practical)
   10. Successive Over-Relaxation (SOR) Method (Practical)
   11. Conjugate Gradient Method (Practical)
6. **Solution of Ordinary Differential Equations**
   1. Euler's Method (Practical)
   2. Runge-Kutta Method (Practical)
   3. Derivation of Runge-Kutta Methods (Practical)
   4. Error Estimation in Euler's and Runge-Kutta Methods
   5. Linear Multistep Methods (Practical)
   6. Adams Methods (Practical)
   7. Predictor-Corrector Methods (Practical)
   8. Stability of Numerical Methods (Practical)