



| Code | Subject Title | Cr. Hrs | Semester |
|----------|---|---------|----------|
| MATH-203 | Mathematics A-IV [Ordinary Differential Equations] | 4 | IV |
| Year | Discipline | | |
| 2 | Mathematics-I,II, Chemistry-II, Statistics-I,II,III | | |

Introduction to Differential Equations

- Historical background and motivation
- Basic mathematical models: Directional fields
- Classification of differential equations

First Order Differential Equations

- Separable equations
- Modeling with first order equations
- Differences between linear and nonlinear equations
- Exact equations and integrating factors

Second Order Differential Equations

- Homogenous equations
- Homogenous equations with constant coefficients
- Fundamental solutions of linear homogenous equations
- Linear independence and the wronskian
- Method of undetermined coefficients, Variation of parameters

Higher Order Linear Equations

- General theory of n th order linear equations
- Homogenous equations with constant coefficients
- The methods of undermined coefficients
- The method of variation of parameters

Series Solution of Second Order Linear Equations and Special Functions

- Series solution near an ordinary point, Legendr's equation
- Regular singular points, Series solution near a regular singular point

Recommended Books

3. W.E. Boyce and Diprima, *Elementary Differential Equations*, 8th Edition, John Wiley & Sons, 2005
4. Erwin, Kreyszig, *Advanced Engineering Mathematics*, John Wiley and Sons, 2004
5. Ross, S.L, *Differential Equations*, John Wiley & Sons, 2004
6. Dennis G.Zill & Michael R. Cullen, *Differential Equation With Boundary Value Problems*, PWS Publihing Company, 2000
7. Richard Bronson, *Differential Equations*, 2nd Edition, Schaum's Outline Series, Mc-Graw Hill Company, New York, 1994