

Syllabus. Ordinary Differential Equations.

Edwards, C., and D. Penney. Elementary Differential Equations with Boundary Value Problems. 5th ed. Upper Saddle River, NJ: Prentice Hall, 2003.

- Solution of First-order ODE's by Analytical, Graphical and Numerical Methods;
- Linear ODE's, Especially Second Order with Constant Coefficients;
- Undetermined Coefficients and Variation of Parameters;
- Sinusoidal and Exponential Signals: Oscillations, Damping, Resonance;
- Complex Numbers and Exponentials;
- Fourier Series, Periodic Solutions;
- Delta Functions, Convolution, and Laplace Transform Methods;
- Matrix and First-order Linear Systems: Eigenvalues and Eigenvectors;
- Non-linear Autonomous Systems: Critical Point Analysis and Phase Plane Diagrams.