

MATH M35: Applied Differential Equations

Course Objectives (COR)

- Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and selected higher order ordinary differential equations.
- Evaluate first order differential equations including separable, homogeneous, exact, and linear.
- Show existence and uniqueness of solutions.
- Create and analyze mathematical models using first order differential equations to solve application problems such as circuits, mixture problems, population modeling, orthogonal trajectories, and slope fields.
- Solve second order and higher order linear differential equations.
- Determine fundamental solutions and independence using the Wronskian.
- Solve nonhomogeneous equations.
- Create and analyze mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits.
- Solve differential equations using variation of parameters
- Evaluate Laplace Transforms.
- Find series solutions.
- Solve linear systems of ordinary differential equations.

Course Learning Outcomes (CLO)

- Solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. Find particular solutions when given initial or boundary conditions.
- Solve higher order linear differential equations using reduction of order, undetermined coefficients, or variation of parameters.
- Find inverse Laplace transforms.