MTH 254: Ordinary Differential Equations

This course covers the methods of solving ordinary differential equations and applications in engineering and the sciences. Topics include equations of the first order, higher order equations, power series solutions and applications. Pre-requisite(s): a grade of C- or better in MTH 215. Three lecture hours per week. Instructional Support Fee applies. 3 credits Fall, Spring, Summer

Course Student Learning Outcomes

1. Solve the first-order differential equations of the following types: the separable equations, the homogeneous equations, the exact equations, and the linear equations.
2. Solve the second-order homogeneous linear equations with constant coefficients, and solve the non-homogeneous equations by the superposition approach.
3. Use the Laplace transform to solve linear (first-order and second-order) differential equations with constant coefficients.
4. Find the power series solutions about the ordinary point of a differential equation.
5. Solve the system of differential equations using the operator method, and using the Laplace transform method.
6. Solve the initial-value problems; and work with the applications – using the differential equation model to describe some real-life phenomena.
7. Locate an approximate solution curve for a first-order differential equation in the direction field; and approximate solutions of the first-order initial-value problems using the numerical methods.

Credits: 3
Program: Mathematics