

Department of Mathematics
MATH 260
Ordinary Differential Equations
 Required **Elective**



AY	Revision History: Changes and Rationale	Progress Exam Affected?
07/08	Syllabus Created	N

Coordinator: Dr. Thomas McKenzie, Associate Professor, Mathematics

Catalog Description: Solution methods for first order equations, and for second and higher order linear equations. Includes series methods, and solution of linear systems of differential equations.

Prerequisites by Topic: Calculus and Analytic Geometry III

Textbook(s) / Require Mat'l: Elementary Differential Equations, 8th Edition by Boyce and DiPrima, John Wiley and Sons Inc. , 2005

Course Topics: First Order Differential Equations (25%)
 Second Order Differential Equations (25%)
 Series Solutions of Second Order Linear Equations (25 %)
 Systems of First Order Linear Equations (25%)

Course Objectives:

- To study linear, separable, and exact linear differential equations.
- To study applications of first order differential equations.
- To study second order homogeneous differential equations.
- To study second order nonhomogeneous differential equations.
- To study applications of second order differential equations.
- To review power series.
- To study series solutions to differential equations near an ordinary point.
- To study Euler equations.
- To review matrices, eigenvalues, and eigenvectors.
- To study homogeneous linear systems of first order linear equations.
- To study nonhomogeneous systems of linear equations.
- To study applications of systems of linear equations.

Professional Components/ Course Outcomes:

By the end of this course the student will be able to:

- Identify different types of first order differential equations, solve them, and solve word problems involving first order equations.
- Identify different types of second order differential equations, solve them, and solve word problems involving second order equations.
- Solve second order differential equations using power series.
- Identify different types of systems of first order linear differential equations, solve them, and solve word problems involving systems of first order equations.

Class/Lab Schedule: 3 classes per week, 50 minutes per session
 3 credits

**Relation to
Program
Outcomes:**

- | | |
|------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> (a) Fundamental math, science, or engineering | <input type="checkbox"/> (b) Experimentation |
| <input type="checkbox"/> (c) Design | <input type="checkbox"/> (d) Teamwork |
| <input type="checkbox"/> (e) Problem solving | <input type="checkbox"/> (f) Professional ethics |
| <input type="checkbox"/> (g) Communication | <input type="checkbox"/> (h) Global awareness |
| <input type="checkbox"/> (i) Life-long learning | <input type="checkbox"/> (j) Contemporary issues |
| <input type="checkbox"/> (k) Modern tools | |

**Computer
Tools:**

Software that is supplied with the book.

**Laboratory
Content:**

no lab

**Design
Content:**