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Differential Equations

MATH-232*

This course is intended for any student who has taken a first year calculus course and wishes or is required to learn more about differential equations *and* is not specifically required to take MATH-231*.

Textbook: *Fundamentals of Differential Equations*, 6th Edition
by Nagle, Saff and Snider (Pearson)

Prerequisite: First year calculus *and* some knowledge of linear algebra (eigenvalues, eigenvectors).

Instructor: L. Roberts

Evaluation:	Homework	15%
	Midterm Test	20%
	Final Examination	65%

Outline:

This course will introduce the fundamentals of creating and solving differential equations. Students will be able to recognize important types of differential equations as they occur in a variety of applications, and will have the skills to solve homogeneous and non-homogeneous linear equations and systems. This course will be helpful for students intent on working in computational biology, environmental science, economics, and other fields involving the quantitative study of dynamic processes.

Areas of study:

- Direction fields
- Solving DEs by direct integration
- Separable equations
- First order linear equations
- Linear DEs with constant coefficients
- Non-homogeneous linear DEs with constant coefficients
- Solving systems of DEs using eigenvectors
- Direction fields for linear systems
- Stability
- Free and forced mechanical vibrations
- Phase plane analysis