

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 SYLLABUS (*Tentative*)
 MATH 311 *Differential Equations I*

- Objective:** To study ordinary differential equations and their applications.
- Intended for:** Majors in Mathematical or Physical Sciences, including Engineering.
- Prerequisite:** Calculus II (MATH 202).
- Text:** "Fundamentals of Differential Equations," by R. Kent Nagle, Edward B. Saff, Arthur David Snider; Addison-Wesley, 6th edition, 2003.
- Software:** MAPLE

<i>Topics (Textbook sections)</i>	<i>Weeks</i>
<i>Introduction to Differential Equations</i>	1.5
Background, Solutions and Initial Value Problems, Direction Fields and Euler's Method (1.1 - 1.3)	
<i>First Order Differential Equations</i>	2.0
Separable Equations, Exact Equation, Linear Equations (2.1 - 2.4)	
<i>Mathematical Models and Numerical Methods</i>	1.5
Mixing Problems, Population Models, Improved Euler's Method (3.1 - 3.4)	
<i>Linear Second Order Equations</i>	3.5
Linear Differential Operators, Fundamental Solutions of Homogeneous Equations, Homogeneous Linear Equations with Constant Coefficients, Auxiliary Equations with Complex Roots, Superposition, Nonhomogeneous Equations, Undetermined Coefficients, Variation of Parameters (4.1 - 4.3, 4.5 - 4.9)	
<i>Applications</i>	2.5
Mechanical Vibrations, Harmonic Motion, Damped and Forced Vibrations (5.1 - 5.4, 5.7)	
<i>Power Series Solutions</i>	1.0
Analytic Functions, Taylor Series Method, Method of Frobenius, Finding a Second Linearly-Independent Solution (8.2 - 8.4, 8.6)	
<i>Systems of Differential Equations</i>	1.0
Elimination Method for Linear Systems, Higher Order Differential Equations (4.10, 9.1, 9.4)	
<i>Examinations</i>	1.0

EVALUATION

Homework	25%
Project	15%
Exams	40%
Final	20%

NOTE: Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.