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

Objective: To study differential equations and their applications.

Intended for: Majors in Mathematical or Physical Sciences and students in the Dual-Degree Engineering Program.

Prerequisite: Calculus II (MATH 202 with a grade of C or better).

Text: "Fundamentals of Differential Equations," by R. Kent Nagle, Edward B. Staff, Arthur David Snider; Addison-Wesley, 9th Edition. MyMathLab maybe required.

	Weeks
Introduction to Differential Equations Basic Definitions and Terminology, Directed Fields, Phase Portraits.	1 1/2
First-Order Differential Equations Preliminary Theory (initial value problems), Separable Equations, Exact Equations, Linear Equations, Applications (linear and nonlinear).	2
Mathematical Models and Numerical Methods Population Models, Improved Euler' s Method, Runge-Kutta Methods	1 1/2
Higher-Order Equations 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.	3
Applications Mechanical Vibrations, Harmonic Motion, Damped and Forced Vibrations.	1
Series Solutions Analytic Functions, Taylor Series Method, Method of Frobenius, Finding a Second Linearly Independent Solution.	1
Systems of Differential Equations Elimination Method for Linear Systems, Higher-Order Differential Equations.	1
Selected Topics	2
Tests	1
Total	14

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.

MAS/jh 1/2015