



STARK STATE COLLEGE

GENERAL SYLLABUS

Course Information

Course Name: Ordinary Differential Equations
Course Number: MTH227

Required Materials

Textbook(s): Differential Equations with Boundary-Value Problems, 10th Edition-by Dennis G. Zill
 Publisher: Cengage Learning
 ISBN (instant access): 9780357760543

Required Readings: None

Additional Materials: A graphing calculator is recommended.

Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

16 Week Calendar

Week	Chapter/Topic/Lab
1	Ch 1 First-Order Differential Equations * Differential Equations and Mathematical models * Integrals as general and particular solutions
2	Ch 1 First-Order Differential Equations * Slope fields and solution curves * Separable equations and applications
3	Ch 1 First-Order Differential Equations * Linear first-order equations * Linear first-order equations: applications * Substitution methods and exact equations * Bernoulli equation
4	Ch 1 First-Order Differential Equations * Population models: growth and decay * Acceleration-velocity models * Test: Chapter 1

Week	Chapter/Topic/Lab
5	Ch 2 Linear Equations of Higher Order * General solutions of linear equations * Homogeneous equations with constant coefficients * Mechanical vibrations
6	Ch 2 Linear Equations of Higher Order * Nonhomogeneous equations and underdetermined coefficients * Forced oscillations and resonance
7	Ch 2 Linear Equations of Higher Order * Electrical Circuits * The method of variation of parameters * Endpoint problems and eigenvalues
8	Ch 3 Power Series Methods * Test: Chapter 2 * Review of power series * Series solutions near ordinary points * Regular singular points
9	Ch 3 Power Series Methods * Method of Frobenius and reduction of order * Test: Chapter 3
10	Ch 4 Laplace Transform Methods * Laplace transforms and inverse transforms * Transformation of initial value problems
11	Ch 4 Laplace Transform Methods * Translation and partial fractions * Derivatives, integrals, and products of transforms
12	Ch 4 Laplace Transform Methods * Review of chapter 4 * Test: Chapter 4
13	Ch 5 Linear Systems of Differential Equations * First-order systems and applications * The method of elimination
14	Ch 5 Linear Systems of Differential Equations * Matrices and linear systems * The eigenvalue method for homogeneous equations
15	Ch 6 Numerical Methods * Numerical approximations: Euler's Method * The Runge-Kutta Method
16	Final Exam Week Final Exam (Chapters 5&6)