

# MATH 220 Applied Differential Equations – Spring 2020

Tuesdays & Thursdays, 11:00 – 12:15, 120 Snow Hall

## Tentative Schedule

- 1/21 Tue. 1.1 Some Basic Mathematical Models; Direction Fields  
1.2 Solutions of Some Differential Equations  
1.3 Classification of Differential Equations
- 1/23 Thu. 2.1 Linear Differential Equations; Method of Integrating Factors
- 1/28 Tue. 2.2 Separable Differential Equations
- 1/30 Thu. 2.3 Modeling with First-Order Differential Equations  
2.4 Differences Between Linear and Nonlinear Differential Equations
- 2/4 Tue. 2.6 Exact Differential Equations and Integrating Factors
- 2/6 Thu. 2.5 Autonomous Differential Equations and Population Dynamics  
2.7 Numerical Approximations: Euler's Method  
2.8 The Existence and Uniqueness Theorem
- 2/11 Tue. 3.1 Homogeneous Differential Equations with Constant Coefficients
- 2/13 Thu. 3.2 Solutions of Linear Homogeneous Equations; the Wronskian
- 2/18 Tue. [Review for Midterm Exam 1](#)
- 2/20 Thu. **Midterm Exam 1 (In Class)**
- 2/25 Tue. 3.3 Complex Roots of the Characteristic Equation
- 2/27 Thu. 3.4 Repeated Roots; Reduction of Order
- 3/3 Tue. 3.5 Nonhomogeneous Equations; Method of Undetermined Coefficients (Part 1)
- 3/5 Thu. 3.5 Nonhomogeneous Equations; Method of Undetermined Coefficients (Part 2)
- 3/10 Tue. [Spring Break – No Class](#)
- 3/12 Thu. [Spring Break – No Class](#)
- 3/17 Tue. 3.6 Variation of Parameters
- 3/19 Thu. 3.7 Mechanical and Electrical Vibrations  
3.8 Forced Periodic Vibrations
- 3/24 Tue. 6.1 Definition of the Laplace Transform  
6.2 Solution of Initial Value Problems
- 3/26 Thu. 6.3 Step Functions

- 3/31 Tue. 6.4 Differential Equations with Discontinuous Forcing Functions  
6.5 Impulse Functions
- 4/2 Thu. 6.6 The Convolution Integral
- 4/7 Tue. [Review for Midterm Exam 2](#)
- 4/9 Thu. **Midterm Exam 2 (In Class)**
- 4/14 Tue. 7.1 Introduction  
7.2 Matrices
- 4/16 Thu. 7.3 Systems of Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors
- 4/21 Tue. 7.4 Basic Theory of Systems of First-Order Linear Equations
- 4/23 Thu. 7.5 Homogeneous Linear Systems with Constant Coefficients
- 4/28 Tue. 7.6 Complex-Valued Eigenvalues  
7.7 Fundamental Matrices
- 4/30 Thu. 7.8 Repeated Eigenvalues
- 5/5 Tue. 7.9 Nonhomogeneous Linear Systems
- 5/7 Thu. [Review for Final Exam – Last Day of Class](#)
- 5/12 Tue. **Final Exam, 10:30 – 13:00 in 120 Snow Hall**