

MATH 251 SPRING SEMESTER 2011
Exam I study guide

Exam Date/Time: Thursday, February 17, 6:30 to 7:45 pm

Format: 100 points in 14 questions (8 x multiple-choice, and 6 x partial-credit / short-answer)

Location: 102 Forum (sections 2, 7, 9); 105 Forum (sections 3, 4, 5, 6); 108 Forum (sections 1, 8, 11, 12); 111 Forum (section 10)

Topics to study

1. Classifications of differential equations
2. First order linear equations
3. Separable equations
4. Existence and Uniqueness Theorems (of 1st and 2nd order linear equations only)
5. Solution-mixing problems
6. Autonomous equations: equilibrium solutions, stability classification (including semistable equilibrium solutions)
7. Exact equations: verification of; and solving them
8. Second order homogeneous linear equations with constant coefficients
9. Linear independence, Fundamental solutions, Wronskian, Abel's Theorem, structure of the general solution of a second order linear equation, and the superposition principle
10. Reduction of order
11. Second order nonhomogeneous linear equations: Method of Undetermined Coefficients

Comments: Students should know basic integration techniques; partial differentiation and integration; the three types of equilibrium solutions; solving linear homogeneous equations using the characteristic equation; and the general long-term behavior of different types of functions and solutions.