Math 339 - Dynamical Systems
Midterm #2 Study Topics

Midterm #2 covers Continuous Dynamical Systems (as opposed to Discrete Dynamical Systems which is what was covered in Midterm #1). The content is Chapter 7 and the additional predator-prey material discussed during class. A breakdown of the basic topics is as follows:

1. Finding steady states and determining their stability, in 1D to 3D systems. Determining stability sometimes requires the use of graphical techniques.

2. Bifurcation diagrams (1-parameter and 2-parameter)

3. Phase plane analysis:

   (a) nullclines
   (b) equilibrium points
   (c) stability
   (d) solution trajectories

4. Competition, mutualism, and predator-prey models

5. Motion in a potential field

6. Lyapunov functions