ME225DS: Dynamical Systems with Symmetry
Winter 2008

Instructor: Jeff Moehlis, moehlis@engineering.ucsb.edu

Lectures: Tuesday, Thursday 3:30-4:45, Phelps 1420
No lecture: Thursday, January 17
No office hours Wednesday, January 16, Thursday January 17

Office Hours: Wednesday 11:00-12:00, Thursday 10:00-11:00, 2350 Engr II Bldg

Course Webpage: http://www.engineering.ucsb.edu/~moehlis/ME225DS

Prerequisites: ME215A and ME215B, or permission of instructor

Grades: based on homework

The following topics will be covered

• group theory
• derivation of ordinary differential equation models by symmetry arguments
• classification of solutions by symmetry
• normal form symmetry
• equivariant bifurcation theory
• global bifurcations with symmetry
• heteroclinic cycles
• forced symmetry-breaking

There is no textbook for the class, but it will draw upon the following references:

• J. Moehlis and E. Knobloch. Equivariant Dynamical Systems
  http://www.scholarpedia.org/article/Equivariant_Dynamical_Systems

• J. Moehlis and E. Knobloch. Equivariant Bifurcation Theory
  http://www.scholarpedia.org/article/Equivariant_Bifurcation_Theory


Useful books on dynamical systems:

• J. Guckenheimer and P. Holmes, Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields
• S. H. Strogatz, Nonlinear Dynamics and Chaos: With Applications in Physics, Biology, Chemistry, and Engineering
• P. Glendinning, Stability, Instability, and Chaos