

FALL 2017  
*Course Announcement*

**APM 560**

**Applied Dynamical Systems**

*Instructor:* Mohamed Moustouai

*Office:* WCLR 847

*Office Hours:* Tuesday & Thursday 12:00-1:15PM or by appointment

*Meeting Schedule:* Tuesday & Thursday 9:00-10:15AM

*Location:* WCLR 109

*Course Description:*

This course will focus on applications of modern dynamical systems methods to problems that arise in physics, biology and engineering. The topics covered will include: introduction to dynamical systems, structural stability and bifurcations, averaging and perturbations, weakly nonlinear dynamics, center manifold theorem and normal forms, applications to fluid dynamics, mixing and chaos.

*Prerequisite:*

There is no prerequisite for this course, although prior exposure to ODEs and PDEs is very helpful.

*Textbooks (not required):*

J. Guckenheimer and P.J. Holmes: *Nonlinear Oscillators, Dynamical Systems, and Bifurcations of Vector Fields* (Springer).

S. Wiggins: *Introduction to Applied Nonlinear Dynamical Systems and Chaos* (Springer).

S.H. Strogatz: *Nonlinear Dynamics and Chaos with Applications to Physics, Chemistry, and Engineering* (Westview Press).