Class #: 14364/14365  
Class Schedule: TTH 2:30—3:45pm  
Room: NS 317

Instructor  Dr. Jiaxu Li  
Office Phone  502-852-6828  
Office  NS 224  
Office Hours  MTH 1:30—2:30pm or by appointment  
Email  jiaxu.li@louisville.edu  
URL  http://www.math.louisville.edu/~jli

Text  Differential Equations and Dynamical Systems (third edition) by Lawrence Perko  
Springer 2001

Objectives  The Theory of Dynamical Systems has been unified as a conceptual framework of applications to Physics, Life Sciences and other interdisciplinary efforts. It studies the behavior of solutions of nonlinear differential equations that are mathematical models of complex phenomena representing the changes of processes in time in their applied disciplines. The general approaches to formulate mathematical models of non-linear dynamical systems have been an important role in physics and biology. The analytical and numerical investigations of such models often reveal intrinsic factors in complex phenomena.

This course is an introductory course for graduate and undergraduate students, who are majored in mathematics, physics, engineering and sciences, to study nonlinear dynamical systems followed by a more advanced course with applications. This course will emphasize on rigorous mathematical treatment of the basic concepts, theorems, methods and techniques in this area. In applications, the focus will be on understanding of problems and the ability to apply the theory to natural sciences.

Tentative Schedule  
Section 1.1 – 1.10; Section 2.1 – 2.14; Section 3.1 – 3.7.

Prerequisites  MAT 405 (Differential Equations) and MAT 325 (Linear Algebra) or instructor’s approval.

Grading  
Homework assignments = 100 points  
Two midterm exams = 200 points
Late assignments will not be accepted except a documented emergency.

Students with Disabilities  
The university of Louisville is committed to providing access to programs and services for qualified students with disabilities. If you are a student with a disability and require accommodation to participate in and complete requirements for a class, contact the Disability Resource Center (Robbins Hall, 852-6938) for verification of eligibility and determination of specific accommodation.

The instructor reserves the right to make changes in the syllabus when necessary to meet learning objectives, to compensate for missed classes, or for similar reasons.