

MATH 635-01

Mathematical Modeling

Fall 2017

Instructor: Dr. Changbing Hu

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Office hours: MTTh 10:50pm – 11:40pm, otherwise by appointment.

Class time and place: TTh 1:00pm to 2:15pm, NS 130

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

Objectives 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 – 3.9, 3.12.

Prerequisites MATH 405 (Differential Equations) and MATH 325 (Linear Algebra) or instructor's approval.

Grading Homework assignments : 40%
Two midterm exams = 2*30% points
Your letter grade ranges will be standard: 100%-A-90%-B-80%-C-70%-D-60%-F.
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.

Title IX/Clery Act
Notification

Sexual misconduct (including sexual harassment, sexual assault, and any other nonconsensual behavior of a sexual nature) and sex discrimination violate University policies. Students experiencing such behavior may obtain **confidential** support from the PEACC Program (852-2663), Counseling Center (852-6585), and Campus Health Services (852-6479). To report sexual misconduct or sex discrimination, contact the Dean of Students (852-5787) or University of Louisville Police (852-6111).

Disclosure to **University faculty or instructors** of sexual misconduct, domestic violence, dating violence, or sex discrimination occurring on campus, in a University-sponsored program, or involving a campus visitor or University student or employee (whether current or former) is **not confidential** under Title IX. Faculty and instructors must forward such reports, including names and circumstances, to the University's Title IX officer.

Note: Out of consideration for the instructor and your fellow students, please **turn off** all cell phones and pagers when you come to class. Should such a device interrupt the class, the instructor reserves the right to ask you to leave the class. For the same reasons, do **NOT** bring food or drink into the classroom; again you may be asked to leave the class.

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.