MAT 351 DIFFERENTIAL EQUATIONS: DYNAMICS AND CHAOS
SPRING 2015
GENERAL INFORMATION

Instructor. Matthieu Arfeux
  Email: `matthieu.arfeux@stonybrook.edu`
  Office: Math Tower 4-119
  Office Hours: Wednesday 9:00-11am, or by appointment

Lectures. TuTh 1:00-2:20pm in Library N3074

Blackboard. Grades and some course administration will take place on Blackboard. Please login using your NetID at `http://blackboard.stonybrook.edu`.

Course Description. Dynamical systems occur in all branches of science, from the differential equations of classical mechanics in physics to the difference equations of mathematical economics and biology.
    This course is an introduction to the field of dynamical systems. It concerns mostly the study of the long-term behavior of iterated mappings (discrete dynamical systems), emphasizing the distinction between stability on the one hand and sensitive dependence and chaotic behavior on the other. The course describes examples of chaotic behavior and of fractal attractors, and develops some mathematical tools for understanding them. In particular we will study the following key concepts: hyperbolicity, topological conjugacy, structural stability, chaos, etc.

Prerequisites. C or higher in the following: MAT 203 or 205 or 307 or AMS 261; MAT 303 or 305 or 308 or AMS 361; MAT 200 or permission of instructor

Textbook. We will try to follow the following textbook:

> Robert Devaney, *An Introduction to Chaotic Dynamical Systems*, 2nd ed., Westview Press, 2003.

Other useful materials and lecture notes will be posted on the course website on Blackboard.

Exams. There will be a midterm and a final exam, scheduled as follows: ??? There will be no make-up exams.

Grading policy. Grades will be computed using the following scheme:

Homework	35%
Midterm	25%
Final Exam	40%

Students are expected to attend class regularly and to keep up with the material presented in the lecture and the assigned reading. There will be (roughly) weekly homework assignments. You may work together on your problem sets, and you are encouraged to do so. However, all solutions must be written up independently. The lowest homework score will be dropped.

Extra Help. You are welcome to attend the office hours and ask questions about the lectures and about the homework assignments. In addition, math tutors are available at the MLC: `http://www.math.sunysb.edu/MLC`.

Special Needs. If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748, or at the following website

http://studentaffairs.stonybrook.edu/dss/index.shtml. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Academic integrity. Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary.

Critical Incident Management. Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.