MAT 351
Differential Equations: Dynamics and Change
Spring 2025

Course description: A study of the long-term behavior of solutions to ordinary differential equations or of iterated mappings, 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.

Lecturer: Dzmitry Dudko, Math Tower 2-117. Office Hours: see **here.**

Textbook, not required:

- "A First Course in Dynamics with panorama of recent developments," by Boris Hasselblatt and Anatole Katok.

Other references are:

- "Chaos: An Introduction to Dynamical Systems," by Alligood, Sauer, and Yorke.
- "An Introduction to Chaotic Dynamical Systems," by Robert Devaney.
- "Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry, and Engineering," by Steven H. Strogatz.

Homework: There will be a biweekly homework assignment posted on **Brightspace**.

Exams: There will be

Midterm on **March 11**, in class; and

Final Exam on **May 15**, Thursday, 11:15 am – 1:45 pm.

Grading: Your final grade will be determined as follows:

Homework: 20%

Midterm: 30%

Final Exam: 50%

Expected Grade will be announced after the Midterm.

Required syllabus statements

Student Accessibility Support Center Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:
https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities
and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement:

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 Professions, 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/commcms/academic_integrity/index.html

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 Student Conduct and 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.