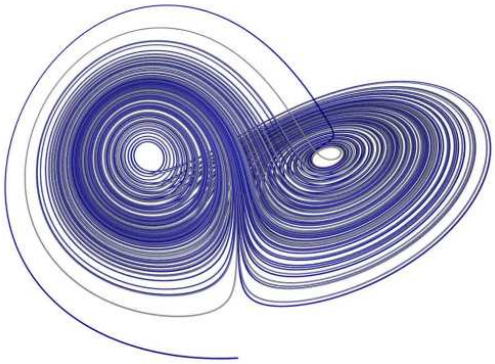
Course Announcement: Math 351 (Spring 2009)
Differential Equations, Dynamics, and Chaos
Instructor: Roland Roeder



Dynamical systems is a relatively recent subject of mathematics and it has close ties with physics, chemistry, and biology, as well as engineering. Math 351 is an introduction to dynamical systems, with the intention to make the subject accessible to people from outside of mathematics, while still indicating some of the deep mathematical theorems and even open problems in the field.

Some of the exciting applications include population models in biology, oscillating chemical reactions, simple mechanical systems displaying surprisingly complicated behavior, and the famous Lorentz equations, which are a simplified model from meteorology that is chaotic. Mathematical highlights include bifurcation analysis, index theory, limit cycles, Hopf bifurcations, chaotic systems, strange attractors, and the theory of one dimensional maps, including Julia sets and the famous Mandelbrot set.

Strong students from other departments who have an interest in dynamical systems (or mathematics in general) are encouraged to enroll. One component of the course will be a course project, for which you can relate the course material to an area of your own interest, from within your major subject.

Course textbook: "Nonlinear Dynamics and Chaos, with Applications to Physics, Biology, Chemistry, and Engineering", by Steven Strogatz.

Course prerequisite: MAT 203 or 205 or AMS 261; MAT 303 or 305 or AMS 361; and some knowledge of elementary physics.

Feel free to contact me if you have any questions, rroeder@math.sunysb.edu