Math 397—Spring 2009 Syllabus

Instructor: Rob Manning, rmanning@haverford.edu, 896-1210, KINSC H207C

Office Hours: W 1-2:30 PM and 4-5 PM, Th 10:30 AM-12:00 PM and 1-2:30 PM, or arrange another time with me

Prerequisites: Math 317, or permission of the instructor

Text: "Chaos: An Introduction to Dynamical Systems", Alligood, Sauer, and Yorke, (Springer, 1998)

Homework: Problem sets due Fridays most weeks (give to me in class or leave in drop box outside my office by 5 PM).

Tests: Instead of HW on Fri. 2/27 and Fri. 4/3, there will be a test due (take-home, distributed the Monday before).

Project: In lieu of a final exam, each student will write a final project. Soon after spring break, I will distribute a list of possible projects, or feel free to make your own suggestion to me (the book has a number of "Challenges" or "Lab Visits", many of which would be suitable). The project can be on the theoretical or computational end, or focus on a particular application. Students will make 20-minute preliminary presentations of their projects during the last week of classes, and submit a preliminary draft of the project report on the last day of classes. The final project report is due by the end of finals period.

Grades:

Homework : 25%
Project : 25%
Tests (2): 25% each

Collaboration: For homework problems, discussion with other students in the class or with me is highly encouraged. What you turn in should reflect your personal understanding of the problems, so you must write the solutions yourself without referring to notes from your collaborative work. If you find you are not able to do this, then probably you have not yet fully understood that particular problem, so you should scrap your solution and come ask me questions.

For the project and tests, no collaboration is allowed (although you are allowed, and expected, to ask me questions about your project).

Anticipated Schedule:

Week 1 (1/21–1/23)	1-dimensional maps
Week 2 (1/26–1/30)	1-dimensional maps (con't)
Week 3 (2/2–2/6)	Chaos in 1D maps
Week 4 (2/9–2/13)	Chaos in 1D maps (con't)
Week 5 (2/16–2/20)	Fractals from 1D maps
Week 6 (2/23–2/27)	2D maps, **Test due 2/27** (on material thru Week 5)
Week 7 (3/2–3/6)	Chaos/Fractals in 2D maps
Spring Break	
Week 8 (3/16–3/20)	Chaotic attractors
Week 9 (3/23–3/27)	Invariant measures
Week 10 (3/30–4/3)	ODEs: introduction, **Test due 4/3** (on material thru Week 9)
Week 11 (4/6–4/10)	ODEs: periodic orbits and limit sets
Week 12 (4/13–4/17)	Poincaré-Bendixson Theorem
Week 13 (4/20–4/24)	Chaos in differential equations
Week 14 (4/27–5/1)	Project presentations, **Draft of project report due 5/1**
	Final project report due by end of final exam period