Some useful texts:

- Strogatz, *Nonlinear Dynamics and Chaos*; this is a well-written but introductory exposition of the subject.

- Guckenheimer and Holmes, *Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields*; a widely used book but not much recent material.

- Ott, *Chaos in Dynamical systems*; this one concentrates mostly on chaos, but has nice explanations.

While I hesitate to “require” any of these texts, all of the ones listed are worthwhile to buy and retain as references.

Instructor:

- Dr. Karl Glasner
- Office: Math 618
- e-mail: kglasner@math.arizona.edu (This is the best way to reach me)
- Office Hours: TTh, 10:00-11:30, and by appointment
- Web: http://www.math.arizona.edu/~kglasner/math557

Grading Policy:

Grades will be based on attendance, class participation, homework assignments and projects which will be periodically assigned. Make-up work is allowable only after written permission is obtained according to university policy. This applies to assignments or exams missed because of illness, family emergencies or personal problems. If written permission cannot be obtained, no credit will be given. No exceptions to this policy will be made by the instructor.

Calendar:

- Week 1: Existence, uniqueness, phase space
- Week 2: Fixed points, stability, linearization
- Week 3: Invariant manifolds, center-manifold reduction
- Week 4: Normal forms, bifurcations
- Week 5: Index theory, limit cycles, multiple scales analysis
- Week 6: Hamiltonian and gradient systems, integrability
- Week 7: Oscillators, coupled oscillators and quasiperiodicity
- Week 8: Maps, stability, the logistic map, period doubling
- Week 9: Invariant sets, lorenz system, strange attractors
- Week 10: Dimension
- Week 11: Bakers and horseshoe maps, symbolic dynamics
- Week 12: Lyapunov exponents, sensitivity to initial conditions
- Week 13: Fractals, basins of attraction
- Week 14-15: Multifractals, other topics of interest