Ordinary Differential Equations

MATH 465 Spring 2016 1:00 - 1:50 KAP 165

Text: Nonlinear Dynamics and Chaos, 2nd ed by
Steven Strogatz

The topics covered in the course will include:
1. Nonlinear models arising in Biology, Mechanics and other Earth Sciences
2. Steady states, bifurcation and oscillations
3. Discrete dynamics; mappings and difference equations
4. Multi-dimensional flows and linear systems
5. Local and global stability
6. Phase portraits, stability and limit cycles
7. Dissipative systems, reversible systems
8. Poincare maps, Hopf bifurcations and higher bifurcations
9. One dimensional maps and Lyapunov exponents
10. Chaotic oscillations, strange attractors and fractals
11. Periodic mapping systems

Professor: Robert Sacker
Office: KAP 438-A, (213)740-3793
Office hours: See "Course Web page" below.
E-mail: rsacker@usc.edu
Personal web page: http://www-bcf.usc.edu/~rsacker
Course web page: http://www-bcf.usc.edu/~rsacker/M465.html
Course credit: 4 units

GRADING POLICY

2 Midterm exams – 40% of grade
Homework – 35%
Final – 25%

Class Schedule

Week	Sections covered
1	2.1 – 2.4
2	2.6, 2.7, 3.0 – 3.2
3	3.3 – 3.5, 5.0, 5.1
4	5.2, 5.3, 6.0 – 6.2
5	6.3 – 6.6
6	6.7, 6.8
7	7.0 – 7.2
8	7.3 – 7.6
9	8.0 – 8.3
10	8.4 – 8.7
11	9.0 – 9.3
12	9.4 – 9.6, 10.0, 10.1
13	10.2 – 10.6
14	11.0 – 11.2
15	11.3 – 11.5
16	(Last day) Review