

Math 117 Suggested Syllabi

Text: *A first course in chaotic dynamical systems, by Robert Devaney.*

Lecture	Chapter/section	Topic
1	2	Examples of dynamical systems.
2	3	Orbits. Rotations of the circle. Doubling map of the circle.
3	4	Graphical analysis of 1-dimensional maps.
4	5	Fixed and periodic points.
5	6	Quadratic map. Bifurcations: from order to chaos.
6	7, 10.4	Cont.
7	9.1-9.2	Symbolic dynamics. Topological Bernoulli shift.
8	9.3-9.4	Conjugacy. Coding.
9	11.4	Subshifts of finite type.
10	11.4	Cont.
11		Smale's horseshoe
12	11.1-11.3	Sharkovskij's Theorem.
13	11.1-11.3	Cont.
14		Review
15		Midterm
16	12	The Schwarzian derivative and basins of attraction.
17	12	Cont.
18	13	Newton's method.
19	14.1-14.4	Examples of Fractals.
20	14.5-14.6	Topological dimension. Fractal dimension.
21	14.5-14.6	Cont.
22	14.7-14.8	Iterated function systems. Examples.
23	15.1-15.2	Complex numbers.
24	15.3-15.4, 16.1	Complex functions.
25	15.3-15.4, 16.1	Cont.
26	16.2-16.6	The Julia set.
27	16.2-16.6	Cont.
28	17	The Mandelbrot set
29		Review