Math 117 Suggested Syllabus

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