

MATH 27
Dynamical Systems with Applications
Lecture Plan

Lecture	Topic	Textbook section (Alligood, Sauer, Yorke)
Lecture 1	Introduction, one-dimensional maps	1.1, 1.2
Lecture 2	Fixed points, periodic orbits, logistic maps	1.3, 1.4, 1.5
Lecture 3	Logistic maps, sensitive dependence on initial conditions	1.5, 1.6
Lecture 4	Two-dimensional maps	2.1, 2.2
Lecture 5	Linear maps	2.3
Lecture 6	Linearization and Jacobians	2.4, 2.5
Lecture 7	Stable and unstable manifolds	2.6
Lecture 8	Chaos, Lyapunov exponents	3.1, 3.2
Lecture 9	Basins of attraction	3.5
Lecture 10	Fractals, fractal dimension	4.1, 4.5
Lecture 11	Chaos in two-dimensional maps	5.1, 5.3
Lecture 12	Continuous-time systems, review of linear ODEs	7.1
Lecture 13	Examples of nonlinear ODEs	7.2
Lecture 14	Limit sets, periodic orbits	8.1, 8.2
Lecture 15	Poincare-Bendixson Theorem	8.3
Lecture 16	Chaos in differential equations, Lorenz attractor	9.1, 9.2
Lecture 17	Lyapunov exponents in flows	9.6
Lecture 18	Stable manifolds, homoclinic/heteroclinic points	10.1, 10.2
