

March 28, 2013

Class Assignments for Math 353 R. Clark Robinson

Book: “An Introduction to Dynamical Systems” by R. Clark Robinson, ISBN 0-13-143140-4

Lecture	Section and Homework
1	Chapter 1 Introduction and Overview
2	2.1 Linear System
3	2.2 Constant Coefficients
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6	2.3 Nonhomogeneous Linear Systems
HW1	Homework 1: 2.1.1, 2.2.1, 2.2.2, 2.2.3, 2.2.4
7	3.1 Properties of Solutions & 3.2 Numerical Solutions
8	4.1 Stability of Fixed Points
9	4.2 One-Dimensional Differential Equations
HW2	Homework 2: 2.3.1, 3.1.1, 3.1.2, 3.2.1, 3.2.3, 4.1.1, 4.1.2
10	4.3 Nullclines for Two-Dimensional Systems
11	4.4 Linearization near Fixed Points
12	4.5 Competitive Populations & 4.6.2 Epidemic Model
HW3	Homework 3: 4.2.2, 4.3.1 (with $\dot{x} = y - x^2$, not part d); 4.4.1, 4.4.2, 4.4.4
13	5.1 Predator-Prey
14	5.2 Undamped Forces
15	5.3 Lyapunov Functions for Damped Systems
HW4	Homework 4: 4.5.1, 5.1.1, 5.2.1; 5.2.3;
16	Applications of Lyapunov Functions
17	5.4 Limit Sets, Bounding Functions
18	6.1 Examples of Periodic Orbit
19	Homework 5: 5.3.1; 5.3.4, 5.4.2
20	6.2 Poincare-Bendixson Theorem
21	6.3 Self Excited Oscillator
HW6	Homework 6: 6.2.1 (use bounding function, not r); 6.2.2; 6.2.7
22	6.6 Change of Area & Volume
23	6.7 Stability of Periodic Orbits
24	7.1 Attractors
HW7	Homework 7: 6.3.1; 6.6.1; 6.7.1; 6.7.4
25	7.2 Chaos
26	7.3 Lorenz Equations
27	7.3 & 7.5 Lorenz Equations & Forced Oscillators
HW8	Homework 8: 7.1.1; 7.1.2; 7.2.1;
28	7.4 Rössler attractor