

01:640:252 ELEMENTARY DIFFERENTIAL EQUATIONS: PROGRESS
(LAST UPDATE: MAY 4TH)

Lecture (date)	Section	Topics	Suggested exercises
1 (Jan. 23th)	1.2	Separation of variables	1.2 Q5-38
2 (Jan. 28th)	1.1	Modelling	1.1 Q6-15, 17, 1.2 Q39-43,
3 (Jan. 30th)	1.3 1.4	Slope fields Euler method	1.3 Q16 1.4 Q5-9
4 (Feb. 3rd)	1.5	Existence and Uniqueness of IVP	1.5 Q1-4, 9, 12-18
5 (Feb. 6th)	1.5 1.6	Proof of Uniqueness Theorem Autonomous system	
6 (Feb. 10th)	1.6	Phase lines	1.6 Q1-28, 33-37, 45-48
7 (Feb. 17th)	1.7	Bifurcation	1.7 Q1-11, 13, 18, 19, 21
8 (Feb. 20th)	1.8 1.9	First order linear D.E.s Integrating factor	1.8 Q1-12, 20-24, 33 1.9 Q1-12, 21, 24-27
9 (Feb. 24th)	2.1 2.2	Introduction to system Geometry of system	2.2 Q7-8, 11, 13-18(a)
10 (Feb. 27th)	–	Midterm 1	
11 (Mar. 2nd)	2.4 2.6	Decoupled system Existence and Uniqueness for Systems	2.4 Q13(a)-(c) 2.6 Q8,9,11
12 (Mar. 5th)	3.0	Linear systems, exponential matrix	
13 (Mar. 9th)	3.0	Exponential matrix (continued)	N4 Q1-3
14 (Mar. 12th)	–	Class cancelled	
15 (Mar. 23rd)	3.2	Straight line solutions	3.2 Q1-14, 17
16 (Mar. 26th)	3.1 3.3	Linearity Principle Phase portrait (Distinct real λ)	3.1 Q5-8, 15-17, 24-29, 35 3.3 Q1-8
17 (Mar. 30th)	3.4	Complex eigenvalues	3.4 Q1, 2, 3-8 (a), (b), (d), 9-14 (a), (b), 16-19, 23
18 (Apr. 2nd)	3.5	Repeated eigenvalues	3.5 Q1-4 (a),(b),(d), 5-8(a),(b), 12, 13, 16
19 (Apr. 6th)	2.3	Damped Harmonic Oscillator	2.3 1-4(b), 5-10
20 (Apr. 9th)	–	Midterm 2	
21 (Apr. 13th)	3.6	2nd order D.E.s	3.6 1-28, 33
22 (Apr. 16th)	4.1 4.2	Forced harmonic oscillators Periodic forcing (underdamped)	4.1 Q1-42 4.2 Q1-14, 16, 17, 19, 20
23 (Apr. 20th)	4.3 –	Periodic forcing (undamped) Variation of Parameters	4.3 Q1-14, 19, 21 Exercises in Note 4.0
24 (Apr. 23th)	5.1	Linearization	5.1 Q1-4, 6, 7-16(a), (b)
25 (Apr. 27th)	5.2	Nullclines	5.2 Q1-15, 21-23
26 (Apr. 30th)	5.2	Lotka Volterra model	
27 (May 4th)	5.3	Hamiltonian System	5.3 Q1-4, 9-13,