

Utah State University
Department of Mathematics and Statistics

Math 2280
(Introduction to Ordinary Differential Equations)
Spring Semester, 2004

Textbook: Elementary Differential Equations and Boundary Value Problems (7th edition)
by William E. Boyce and Richard C. DiPrima (John Wiley Publishers)

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Office Hours: Monday: 11:30 am - 12:30 pm
Tuesday: 10:00 am - 11:00 am
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plus by appointment only; please make an appointment with me at least one day in advance if you cannot make a scheduled office hour.

Grading Policy: There will be **two** midterm examinations, a final **comprehensive** examination, and **weekly quizzes** given to determine your final grade. Each midterm examination will be worth 30% of your final grade; the final examination is worth 30% of your final grade, and the weekly quizzes will amount to 10% of your final grade. These quizzes will likely be given on Fridays (but it will most likely be the case that some will be postponed until the following Monday) and will cover the material from the work assigned from the previous week's work. Usually, one or two problems will be given on each quiz. **There will be no homework collected.** The best eight quizzes will make up your quiz percentage. Since there are going to be extra quizzes given, there will be positively no makeup quizzes. Furthermore, there will be no makeup examination given either; it is up to you to make sure that you are present on the day of the examination. **NO EXCEPTIONS!**

A Note on Incompletes: I have a very strict, personal policy on incomplete grades: I will not give an incomplete grade unless the student has been ill for a good part of the semester and can obtain a doctor's medical certificate to authenticate the illness. **NO EXCEPTIONS!**

Examination Schedule:

Examination 1: Friday, February 6 (tentative)

Examination 2: Friday, March 19 (tentative)

Final Examination: Friday, April 23, 9:30 - 11:20 am

Your final grade will likely be based on the following percentages:

A: 90+ B: 80-90
C: 70-80 D: 60-70
F: < 60

Math 2280 Syllabus

Section	Pages	Problems
1.1 Some basic mathematical models; direction fields	8-9	1,3,5,9,11,15,17.
1.2 Solutions of some differential equations	14-17	1,3,7,11,12,15.
1.3 Classification of differential equations	22-23	1-27 (odds).
2.1 Linear equations with variable coefficients	38-39	1-19 (odds), 25,27,37.
2.2 Separable equations	45-47	1-15 (odds),21,23,25,30,31,33.
2.3 Modeling with first order equations	57-64	1-13 (odds),14,15,21,23.
2.4 Differences between linear and nonlinear equations	72-74	1,3,7,11,22,27,28,29,32,33.
2.7 Numerical Approximations: Euler's method	103-105	1,3,5,11.
8.1 The Euler or tangent line method	427-429	1-9 (odds).
8.3 The Runge-Kutta method	438-439	1-9 (odds).
4.1 General theory of nth order linear equations	212-214	1-15 (odds), 17,19,20,21,23.
3.1 Homogeneous equations with constant coefficients	136-137	1-17 (odds), 21,25.
3.2 Fundamental solutions of linear homogeneous equations	145-147	1-6 (all), 7,9,11.
3.3 Linear independence and the Wronskian	152-153	1-11 (odds), 12,13,15,17,19,21,25.
3.4 Complex roots of the characteristic equation	158-160	1,3,7-25 (odds), 28,34,35,37,38,39,41.
3.5 Repeated roots, reduction of order	166-169	1-19 (odds), 22,23,25,27,31,38,40.
4.2 Homogeneous equations with constant coefficients	219-222	1,3,5,11-27 (odds),29-37 (odds).
3.6 Nonhomogeneous equations; method of undetermined coefficients	178-179	1-15 (odds), 27,28,29,30.
4.3 The method of undetermined coefficients	224-226	1-17 (odds).
3.7 Variation of parameters	183-185	5,7,9,13,15,17,22,23,24,29,31.
4.4 The method of variation of parameters	229-230	1-13 (odds).
3.8 Mechanical and electrical vibrations (<i>optional</i>)	197-200	1,3,5,7,8,9,11,15,17,19,24,29.
3.9 Forced vibrations (<i>optional</i>)	205-207	1-11 (odds), 17,19,23.

Section	Pages	Problems
5.1 Review of power series	237-238	1-15 (odds), 18,19,20,21-27 (odds), 28.
5.2 Series solutions near an ordinary point, part I	247-248	1-17 (odds), 21-27 (odds).
5.3 Series solutions near an ordinary point, part II	253-255	1,2,3,5,7,10,11,13,22,24,25,26,28,29.
5.4 Regular singular points	259-260	1-17 (odds), 19,20,21,23,25,27.
5.5 Euler equations	265-267	1-27 (odds).
5.6 Series solutions near a regular singular point, part I	271-272	1-11 (odds), 13,14,15,16.
5.7 Series solutions near a regular singular point, part II	278-280	1-9 (odds), 13-19 (odds).
5.8 Bessel's equation	289-291	1,3,5,7,8,9,10.
6.1 Definition of the Laplace transform	298-299	5,7,9,11,12,13,14,26,27.
6.2 Solutions of initial value problems	307-310	1-11(odds), 15,23,25,28,35,36,37.
6.3 Step Functions	314-317	7-17 (odds), 19-23 (odds), 25,29.
6.4 Differential equations with discontinuous forcing functions	321-324	1-9 (odds).
6.5 Impulse functions	328-330	1-11 (odds), 15.
6.6 The convolution integral	335-337	1-11 (odds), 15,17.
7.1 Introduction	344-347	1-9 (odds).
7.2 Review of matrices	355-357	1-17 (odds), 23,24,25.
7.3 Systems of linear algebraic equations, linear independence, eigenvalues, eigenvectors	366-367	15-23 (odds), 25-33 (odds).
7.4 Basic theory of systems of first order linear equations	371-372	2,3,4,5,6,7.
7.5 Homogeneous linear systems with constant coefficients	381-383	1-17 (odds).
7.6 Complex eigenvalues	390-393	1-15 (odds).
7.7 Fundamental matrices	400-401	1-11 (odds).
7.8 Repeated eigenvalues	407-410	1-11 (odds), 17,19,21.
7.9 Nonhomogeneous linear systems	417-418	1-11 (odds).