

Math 205 Section 15, Spring 2012–Syllabus

Course Information and Policies

Instructor: Prof. Bruce Dodson

Content: This course provides an introduction to ordinary differential equations (mainly separable and linear differential equations and systems of linear differential equations) and to linear algebra (including systems of linear equations, matrices, eigenvalues and eigenvectors, and vector spaces). Physical applications are also discussed. This corresponds to most of the first seven chapters of the text for the course; see the schedule of lectures below for details.

Prerequisites: Math 22 or 32.

Text: *Differential Equations and Linear Algebra*, third edition, by Stephen W. Goode and Scott A. Annin. ISBN-13: 978-0-13-045794-3.

Attendance: Attendance is required.

Exams: There will be two 4 o'clock exams. The first will be on Wednesday, February 15, and the second will be on Wednesday, March 28. There will a final exam at a date and time to be set by the registrar. Make-up 4 o'clock exams will require a note from a doctor or a dean, and make-up finals are given according to university policy. In no case will a make-up exam be easier than the regularly-scheduled exam. If you are aware of a conflict with an exam, please inform your instructor as soon as possible.

Homework: There will be regular homework assignments. There may also be quizzes, at the discretion of individual instructors. While this syllabus has dates for homework assignments, those are only a guide. Homework on a particular section is assigned when I assign it. Unless otherwise stated, homework will be due two lectures after it is assigned. A small number of problems from each assignment will be graded. Your homework must be legible and intelligible. Full credit will only be given for homework that is clearly and logically presented as well as having the right answer. Late homework will **not** be accepted. In part to compensate for this, and for illness, bad luck, etc., 80% of the total homework points will earn 100% of the homework grade. Students may discuss the homework with other students, but must write their solutions individually. Copying of hand-written, typed, or on-line solutions is not allowed under any circumstances and will be reported as plagiarism. (More information about academic integrity can be found at www.lehigh.edu/~indost/conduct/aiforstudents.shtml.) Finally, doing the homework is the best way to learn the material and ultimately succeed in the course.

Grading: The homework (and quizzes) will count for 20% of the final grade, each 4 o'clock for 20%, and the final for 40%. Students earning 90% of the total will receive at least an A-, 80% will be at least a B-, and so on.

Calculators: No calculators, computers, or electronic devices of any sort can be used on any exams. You should keep this (and the fact that exams are closed book) in mind when doing the homework.

Additional Help: The math department runs the Math Help Center, located in Christmas-Saucon B001. Students can drop in for help whenever it is staffed; a schedule is generally posted outside. In addition the university provides the Writing and Math Center (see www.lehigh.edu/~incent/index.shtml) and the Peer Tutoring service (see www.lehigh.edu/~inacsup/cas/about.shtml).

Disabilities: If you have a disability for which you are or may be requesting accommodations, please contact both the instructor and the Office of Academic Support Services, University Center C212 (610-758-4152), as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted. Furthermore, you must make arrangements for accommodations at least one week before the respective exams.

Schedule of lectures and homework

The following schedule is tentative and subject to revision as necessary. Also recall that homework will be officially assigned by section as the course progresses.

Note: Occasionally the book gives directions to solve homework problems by a specific method. Unless otherwise instructed, you may use any correct method to solve the problems.

- Week 1 (Jan. 16) **1.1:** 7, 9, 11
1.2: 7, 10, 11, 16
1.3: 8, 12, 13
1.4: 3, 4, 6, 7, 13, 18
1.5: 1, 2, 3, 4
1.6: 3, 4, 5, 7, 8, 12, 14, 15, 17
- Week 2 (Jan. 23) **1.7:** 1, 2, 4, 5, 6
2.1: 10, 11, 14, 15
2.2: 1, 3, 10, 13, 15
2.3: 1, 3, 5, 6, 9, 10
- Week 3 (Jan. 30) **2.4:** 10, 11, 12, 16, 18, 20, 24
2.5: 1, 2, 4, 8, 10, 12, 14, 16, 33, 35, 44, 48
2.6: 4, 9, 10, 11, 14, 18, 19
- Week 4 (Feb. 6) **3.1:** 8, 11, 14, 18
3.2: 4, 10, 16
3.3: 11, 13, 14, 16, 19
3.4: 2, 3, 6, 7, 8, 10
4.1: 1, 2
- Week 5 (Feb. 13) **4.2:** 3, 4, 5
4.3: 3, 4, 6, 15, 18, 20, 21
4.4: 1, 6, 8, 9, 10, 11, 14, 22, 24
- Week 6 (Feb. 20) **4.5:** 1, 2, 4, 8, 29
4.6: 2, 3, 4, 10, 11, 13, 14, 21, 22
- Week 7 (Feb. 27) **4.7:** Coursesite 1, 3, 6, 8
4.8: 4, 8, 12
4.9: 3, 4, 10

Week 8 (Mar. 12)	5.1: 2, 3, 12, 17, 24, 26 5.3: 2, 4, 6, 7, 9 5.4: 3, 5, 9, 10, 11, 24
Week 9 (Mar. 19)	5.6: 2, 10, 11, 12, 14, 16, 18, 20 5.7: 1, 3, 4, 5, 6, 9, 10, 14, 20, 21, 22, 24 5.8: 4, 5, 8, 10, 12, 13
Week 10 (Mar. 26)	5.5: Coursesite 1, 4, 5, 6, 8, 10 6.1: 8, 9, 20, 23
Week 11 (Apr. 2)	6.2: 5, 6, 7, 8, 9, 10, 11, 13, 19, 20, 21, 22, 28, 30, 32, 33 6.3: 18, 19, 21, 28, 29, 30
Week 12 (Apr. 9)	6.5: 4, 8, 10, 23 6.6: 1, 4 7.1: 14, 16, 18
Week 13 (Apr. 16)	7.4: 1, 2, 3, 4, 5, 6, 9, 10, 12, 13, 18 7.6: 1, 2, 3, 4
Week 14 (Apr. 23)	7.2: 3, 7, 9 7.3: 1, 3, 5 review and catch-up

Note the following information on some of the homework problems:

Sections 4.7 and 5.5: The exercises are *not* taken from the book, but rather are posted on Coursesite.

Section 5.8: In problem 8, the characteristic polynomial is $-\lambda^2(\lambda - 3)$, and in problem 13, the characteristic polynomial is $-(\lambda - 2)^2(\lambda - 1)$.

Section 6.3: In problem 29, $D^3 - 2D^2 - D + 2 = (D - 1)(D + 1)(D - 2)$, and in problem 30, $D^3 - 3D^2 - 16D + 48 = (D + 4)(D - 4)(D - 3)$.

Section 7.4: In problem 12, the characteristic polynomial is $-(\lambda - 2)^2(\lambda + 1)$, in problem 13, the characteristic polynomial is $-\lambda^2(\lambda - 4)$, and in problem 18 the characteristic polynomial is $-\lambda(\lambda - 2)(\lambda - 4)$.

Also please note the following typo in the text. (There may be others, but this one was pointed out by a 205 student last semester.) On page 499, displayed equation (6.6.3) is correct, but the equation that follows is not. Instead of reading $r^2 + \frac{R}{L}r + \frac{1}{LC}C = 0$, it should read $r^2 + \frac{R}{L}r + \frac{1}{LC} = 0$.