

SYLLABUS FOR MATH 353-02: ELEMENTARY DIFFERENTIAL EQUATIONS

SPRING SEMESTER 2017

Course Information

Instructor: Dr. Erwin Miña-Díaz Office: Hume Hall 317 Office hours: M. W. 9:30-11:00 AM.

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Text: D. G. Zill, A first course in differential equations (classic 5th edition), Brooks/Cole 2001.

Time/Place: T. TH. 11:00-12:15 PM, Hume 201

Course description/learning objectives

This course is an introduction to ordinary differential equations. We intend to cover Chapters 1, 2, 4, and 7 of the textbook, together with some applications from other chapters. This includes first-order differential equations and their applications, linear differential equations of higher order, and the Laplace transform.

The successful student will acquire a good knowledge of the topics studied in the course, being able to classify (i.e., recognize the type of) a differential equation and apply proper methods to solve it. The course will prepare the student for those higher level courses in Mathematics, Physics, Engineering, and Economics, where a basic understanding of ordinary differential equations is needed.

Homework

The homework problems are assigned at the end of the second page.

Tests and final exam

There will be 3 tests (each 100 points) and a final exam (200 points). Your final exam grade (divided by two) will replace your lowest test score. Tests and final exam dates are indicated in the tentative schedule below.

The cumulative point total for the course is 500 points. The grade scale is as follows: A is 465 pts = 93%, A- is 450 pts = 90%, B+ is 435 pts = 87%, B is 415 pts = 83%, B- is 400 pts = 80%. C+ is 385 pts = 77%, C is 350 pts = 70%, D is 300 pts = 60%, F is less than 300 pts. An "I" grade will not be given without the permission of the Department of Mathematics.

IMPORTANT:

1. If a test is missed for ANY reason, a grade of zero will be given. There will be NO make-up tests given for ANY reason.
2. Any student who will miss a test because of an official university function must reschedule and take this test at a time BEFORE the test is scheduled to be given. NO OTHER rescheduling is allowed.
3. Any student having three or more final examinations scheduled for the same day will arrange with the instructor to take the examination on some other, mutually satisfactory date.
4. Every student must take the final exam at the time scheduled. The only exceptions are those students affected by # 2 or # 4 above.

Attendance, cheating, electronic devices, and academic needs

- Students are allowed 3 absences. Ten points are deducted from the final point total for each absence. It is the student's responsibility to make sure his/her attendance record is correct.
- Cheating on any exam or quiz, theft or attempted theft of exam questions, possession of exam questions prior to the time for examination, or the use of an illegal calculator on tests or quizzes shall all be offenses subject to appropriate penalties.
- No calculators allowed in any test/exam. All cellular phones, pagers, and other electronic equipment must be turned off during the class period.
- It is the responsibility of any student with a disability who requests an accommodation to contact the Office of Student Disability Services (915-7128).

Deadlines

Friday, February 3 is the last day to register or add classes and the refund period ends. Friday, March 3 is the deadline for course withdrawals. After the course withdrawal deadline, courses dropped will be recorded on University records and the W grade will be recorded if the student is not failing the course at the time of withdrawal; otherwise the grade recorded will be F. After the course withdrawal deadline, a student may drop a course only in cases of extreme and unavoidable emergency as determined by the academic dean; dropping a course after the deadline will not be permitted because of dissatisfaction over an expected grade or because the student is changing his/her major.

TENTATIVE TEST DATES AND HOMEWORK ASSIGNMENTS

TEST 1 (Tuesday, February 14)

Chapter 2. First-order differential equations.

- Equations solved by separation of variables
- Homogeneous equations
- Exact equations
- Linear equations

WARNING: Test 1 is difficult for many reasons, do not take it lightly.

TEST 2 (Thursday, March 9)

- Bernoulli equation

Chapter 4. Linear differential equations of higher order.

- Linear independence and Wronskian
- Homogeneous equations with constant coefficients
- Non-homogeneous linear equations

TEST 3 (Tuesday, April 11)

- Method of undetermined coefficients (Superposition approach)
- Method of variation of parameters

Chapter 7. Laplace transform.

- Laplace Transform and its inverse

FINAL EXAM (Tuesday, May 9 at Noon)

The final exam is comprehensive, and will include the following topics not listed above from Chapter 7:

- Translation theorems
- Derivatives of transforms and transforms of derivatives
- Initial value problems using Laplace transform

HOMEWORK PROBLEMS

2.2 Ex: 1-20, 40-45.

2.3 Ex : 1-30.

2.4 Ex: 1-15, 25, 26, 31, 32.

2.5 Ex: 1-50.

2.6 Ex: 1-6.

4.1.2 Ex: 15-29.

4.2 Ex: 1-13, 21, 23, 31.

4.3 Ex: 1-20, 37-40.

4.4 Ex: 1-16.

4.7 Ex: 1-28.

7.1 Ex: 1-40.

7.2 Ex: 1-34.

7.3 Ex: 1-44.

7.4. Ex: 1-20.

7.5. Ex: 1-26.

Note: You are not expected to solve every single homework problem from the above list. However, the more you practice the better, and these are typical problems that may appear on tests.