Syllabus for Math 353-01: Elementary Differential Equations

Spring Semester 2016

Instructor: Dr. Erwin Miña-Díaz
Office: Hume Hall 317
Office hours: M W F from 9:00-10:00 AM, or by appointment
Email: minadiaz@olemiss.edu Telephone: (662) 915-1204

Course Information

Time/Place: M W F, 11:00-11:50 AM, Hume Hall 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.

Lecture notes and homework

Keeping a good set of lecture notes and doing the homework is a must to perform well in this class. Referring to the examples developed in class should be of great help for solving the homework problems. The homework problems will be assigned at the beginning of each lecture.

Tests and final exam

1. There will be 3 tests during the semester, each worth 100 points.
2. The final exam will count 200 points. Every student must take the final exam at the time scheduled.
3. The tests and final exam dates are indicated in the tentative schedule below.
4. The cumulative point total for the course is 500 points. The following point scale will be used to determine your final grade: 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 that 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. Students must show all work for each test question and arrive at a correct answer.
4. 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.
5. Every student must take the final exam at the time scheduled. The only exceptions are those students affected by # 2 or # 4 above. The final exam is on Tuesday, December 8, at 4 pm.

Attendance policy

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**

Offenses: 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.

Penalties: The penalty for commission of any offense set out above is failure in the course and, subject to the approval of the Chancellor, dismissal or suspension from the University.

**Calculators and other electronic devices**

No calculators allowed in any test/exam. All cellular phones, pagers, and other electronic equipment must be turned off during the class period.

**Deadlines**

Friday, February 5th is the last day to register or add classes and the refund period ends. Friday, March 4 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.

**Academic needs**

It is the responsibility of any student with a disability who requests a reasonable accommodation to contact the Office of Student Disability Services (915-7128). Contact will then be made by that office through the student to the instructor of this class. The instructor will then work with the student so that a reasonable accommodation of any disability can be made.
TENTATIVE TEST DATES AND HOMEWORK ASSIGNMENTS

TEST 1 (Wednesday, February 17)

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 (Wednesday, March 23)

- 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 (Wednesday, April 20)

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

Chapter 7. Laplace transform.
- Laplace Transform and its inverse

FINAL EXAM (Monday, 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. 4.3 Ex: 1-20, 37-40.


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