Math 212     Spring 2020

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Office hours: To be announced on Canvas

Textbooks and References:


G. Simmons, *Differential Equations with Applications and Historical Notes, 3rd edition.* (recommended)

M. Kline, *Mathematical Thought in the Western World.* (Contains some history of differential equations.)

Handouts, and excerpts from other texts will be used.

Course Content: Mathematics 212 is a first course on differential equations, primarily ordinary differential equations (ODEs). Topics include symbolic methods of solution for first-order equations and higher-order linear equations; modeling with first-order and higher-order differential equations; systems of linear first-order differential equations; series solutions of linear equations; an introduction to Fourier series; existence and uniqueness of solutions, phase space, geometry of ODEs including equilibria and stability; initial-value problems, boundary-value problems; and if time permits numerical methods.

Course Goals: Upon completion of this course the student should be able to solve various differential equations by various symbolic methods; be familiar with and be able to apply the main points in the theory of ODEs; be able to investigate qualitative aspects of a given ODE.

Attendance/Class Participation: Students are expected to attend all classes and are responsible for all materials covered in class.

The course is student-centered and inquiry-driven. Before class, students are expected to study assigned materials, take notes and try to understand most of the basic definitions, examples and concepts. Sometimes a pre-lecture quiz will be given to evaluate how well a student is prepared for class. Students are expected to bring to class a list of questions and thoughts relevant to the topics to be discussed.

Students should actively participate in class-discussions. Being absent, late, inattentive or inactive will lead to deductions to one’s class participation grade. Attendance and consistent preparation for class will determine the success or failure the student realizes in this course.

Quizzes: Both announced and unannounced quizzes will be given. Some are meant to check how well a student is prepared for class (see above), others are to check one’s understanding after a topic has been discussed. When appropriate, some quizzes will be done in groups. A student must be present to take a quiz. No make-up quizzes will be given.

Assignments: Homework will be assigned almost every day of class. Most of these exercises will not be collected and are for the benefit of the students. Selected homework problems will be collected and graded. It is important for the success of the student that homework be completed as soon as possible after covering the material. Use good style on your homework.

Collaboration on homework is allowed, however each student should make sure that ultimately he or she can solve problems unaided by notes, the textbook or other people.

Tests: Two comprehensive midterm examinations will be given in class. Details will be announced later. Students are expected to take tests at the scheduled times. For legitimate reasons and conflicts students may take the tests prior to the scheduled time. Any emergencies will be handled on an individual basis and
must be documented. No make-up test will be given after the testing time.

Final Project: In groups, students will study a topic related to differential equations not covered in class. Details will be announced later.

Final Exam: A cumulative final examination will be given at the time scheduled by the Registrar.

Grading: Grades will be based on assignments collected for credit (10%), quizzes (15%), class participation (10%), two midterm examinations (30%), final project (15%) and final examination (20%). These percentages are approximate. Each student’s work will be judged in relation to the goals set for the course.

Written Work: Thoughts are expressed by sentences. Your written work must be in complete sentences. Use mathematical symbols wherever appropriate. Pay attention to how the problems are worked out in the textbook. Your work should be neat and legible. It is common practice to rewrite solutions once they are found.

Calculators: In general, calculators will not be allowed unless the opposite is announced.

Support Services: Students should utilize the following resources:

- Office Hours: Office hours will be posted on Canvas. Students should use this time to ask specific questions related to this course and/or homework problems.
- Canvas Site: There will be a Canvas course site. Documents and announcements related to the course will be posted there. This includes topics covered that day, homework assignments, suggestions on studying the textbook, topics to preview before next lecture and other announcements. Students should check the site at least once a day.
- Help Sessions: Out-of-class review sessions may be scheduled as needed.
- Study Groups: Study groups organized by students are highly recommended. The meetings should be scheduled weekly and should be part of a regular weekly routine.

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