MATH 2552 DIFFERENTIAL EQUATIONS

GEORGIA TECH EUROPE

COURSE SYLLABUS

Updated on Sep 17 2024

Welcome to Differential Equations!

All our students play an important role in our educational mission. Differential Equations are a fundamental topic of Engineering Sciences.

1. Course Description

Course Title: Differential Equations

Course Meeting Times: TBA

Studio Meeting times: TBA

1. Instructor and Teaching assistant

Instructor: Hyun Jeong KIM

Office: 103B

Office Hours: TBA

E-mail : hkim3224@gatech.edu

Teaching Assistant: TBA

Office: TBA

Office Hours: TBA

E-mail: TBA

3. Textbook

Differential Equations: An Introduction to Modern Methods & Applications, 3rd edition, by Brannan & Boyce. Wiley. ISBN 9781118531778. The GT Bookstore has online, hard cover, and soft cover editions available.

4. Information

Information: Announcements and course-related documents will be posted on Canvas.

5. Grades

Final grades will be calculated using whichever of the following weights yields the higher grade.

Assessment	Weight 1	Weight 2
Participation	2%	2%
Homework	10%	10%
Quizzes	18%	18%
Midterms	30%	40%
Final Exam	40%	30%

Letter grades will be determined based on the usual intervals. **A**: 90% and higher, **B**: [80%, 90%), **C**: [70%, 80%), **D**: [60%, 70%), **F**: [0%, 60%). For example, a final grade of 89.99% is converted into a B, a final grade of 79.99% is converted into a C, and so on. Any changes to these intervals would only be made after the final exam. The best three quizzes will be kept, in other words out of the four quizzes the worst grade will not be included in the calculation of the final grade. A **midterm grade** will be assigned. A satisfactory grade will be assigned to all students with a midterm average of 70% or higher.

6. Learning Outcomes and Topics

Learning outcomes (or learning **objectives**) are statements that articulate what students are expected to do in a course. The learning outcome for this course includes the following.

- **Classify** differential equations (by order, linearity, homogeneity, exact, separable, etc) and apply their classification to determine which methods can be used to solve them.
- **Solve** differential equations using techniques introduced throughout this course and **interpret** the solution to characterize a system.
- **Model** real-life situations using differential equations.
- **Analyze** mathematical statements and solutions of differential equations (for example, by using a direction field or a phase portrait).
- **Write** logical progressions of precise mathematical statements to justify and communicate your reasoning.

Topics covered include methods for obtaining numerical and analytic solutions of elementary differential equations. Applications are also discussed with an emphasis on modelling. Topic outline:

- Introduction and Euler's method
- First Order Differential equations
- Systems of two first order equations
- Second order linear equations
- Laplace Transform Methods
- Systems of first order equations
- Nonlinear Differential Equations and Stability; Numerical approximation of solutions

The list of which sections are covered in lecture is in the syllabus. Students are not expected to be familiar with the material in the sections that are not covered.

7. Expectations

7.1 Students

Students are expected to attend lectures and recitations and behave at all times in a respectful manner to their instructor, teaching assistants, and fellow students. Students are expected to study the subject matter outside of class time, review this syllabus, review their graded work in a timely manner for potential marking errors and to review where mistakes were made (if any), and ask for help when needed. Students are responsible for obtaining any announcements or materials sent by email or communicated orally in class.

7.2 Teaching Assistants (TAs)

TAs are responsible for facilitating learning activities during recitations, holding office hours, marking, and responding to questions from students via email and during office hours and recitations.

7.3 Instructor

As your instructor, my role is to facilitate interactive lectures, coordinate with teaching assistants to grade student's work and facilitate learning activities, provide students with assessments that both develop and measure their understanding and knowledge of the subject matter, provide feedback on their performance, provide solutions to midterms, and be available for assistance when requested.

8. Preparing for Tests

Practice materials and additional office hours will be offered prior to each test. Depending on your goals, you may need to complete additional work beyond homework, worksheets, and practice materials to adequately prepare for them.

9. Homework, Participation, Tests Policies

HOMEWORK : Weekly Homework will be assigned on **Webwork** due every Wednesday 11:59pm. You are expected to understand all homework problems for all quizzes and exams. In order to increase the effectiveness of lectures, you should attempt problems before lectures. **Two** lowest HW scores will be dropped.

PARTICIPATION: Attending class is important. Class attendance and participation will be recorded and scored on a 0-2 scale. The scale is determined as follows: 2 points for above 80% attendance, 1 point for 50%-80% and 0 for below 50%. The participation **grade** will be added onto the final average at the end of the term, affecting all borderline grades. Late arrivals will be also noted.

QUIZZES: There will be five quizzes of 15 minutes during the recitation. Tentative dates are Jan 16, Jan 30, Mar 6, April 3 and April 17. **One** lowest quiz score will be dropped.

MIDTERMS: There will be two midterms of 50 minutes during the recitation. Tentative dates are Feb 13 and Mar 20. There's no dropping for midterm.

FINAL EXAM: The final exam will cover all course materials and will be administered during the final exam period (the exact date will be announced later.) for 2 hours and 50 minutes. All students must take the final examination. The final exam schedule is non-negotiable.

Assessments: Midterms and Quizzes will be returned in class after grading and the solution will be posted on Canvas for review.

9.4.1 Tests Procedures

- Books, notes, cell phones, and calculators are not allowed during tests.

- Students may have something to write with and an eraser when taking tests.

- Unless students are asked to use a particular method or theorem, they are allowed to use any approach to solve any problem they are given on any test.

- Unless indicated otherwise, students must adequately justify their reasoning for full marks.

- Marks can be taken off in a test for not using the correct notation.

- The tests are comprehensive.

- Students who are unable to take any test for any reason are responsible for notifying their instructor prior to the exam and as soon as possible.

- Tests will be returned to students in class.

9.4.2 Additional Final Exam Procedures

Students take their final exam in the room where they have lectures (as per institute policy). The duration, date, and time of the final exam for local students is listed on the registrar website: http://www.registrar.gatech.edu/registration/exams.php Note that the schedule of the final exam is non-negotiable.

9.4.3 Re-grade Requests for Tests

1) If any of your work has been graded in error, you should contact your **instructor** as soon as possible.

2) Teaching assistants are not permitted to handle re-grade requests.

3) Should you wish to have your work re-graded, do not change or add to the work on your paper.

4) A re-grade request can only be submitted if you did something correct that was marked as incorrect.

5) Re-grade requests **must be requested within two weeks** after the work has been returned to you.

6) You must check your answers with the solutions before submitting such a request.

7) To submit a re-grade request, you must send your instructor an email from your GT email account that contains your first and last name, the midterm you are referring to, the question(s) you are referring to, and a description of what was graded incorrectly.

10. Illnesses, Emergencies, Absences

Students who will miss a midterm or final exam due to a university-sponsored event or athletics should provide their instructor with the official documentation in advance. Any student who misses a test, with reasonable explanation, can write a make-up. Students must notify their instructor as soon as they can to make necessary arrangements.

11. Re-Scheduled/Missed Exams

NO MAKE-UP EXAMS! All the test dates are already published. No make-up or earlier test will be allowed due to travel. Please do not make any plan for travel for these dates and missing test score will be "0".

- If you have a valid reason to request a make-up exam, please contact me as early as possible. Only extraordinary cases will be considered.

- In the case of illness and emergency, please contact the Office of Dean of Students immediately. The Dean's office will verify the case, determine the severity of the problem, and then interact with the instructor if necessary.

- Requests for student organization excused absences must be made no later than two weeks prior to the date of the event. No late requests will be honored. Please have your advisor send me a written notice or an e-mail.

- Students who are absent because of participation in a particular religious observance will be permitted to make up the work missed during their absence with no late penalty, provided the student informs me of the upcoming absence, in writing, within the first two weeks of class, and provided the student makes up the missed material within the timeframe established by the course instructor.

- If you have off campus interviews for jobs or graduate/professional schools on the test dates, please contact me as early as possible with a supporting document.

12. Class Policies

12.1 Attendance

In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class. Class disruptions of ANY kind will NOT be tolerated and may result in your removal from the classroom. Please show courtesy to your fellow classmates and instructor by adhering to the following class rules.

- Come to class on time and stay for the entire class period.

- Refrain from conversing with your fellow students while the instructor is lecturing.

- Put away any reading materials unrelated to the course.

- **No laptop or cell phone is allowed on tables.** Please keep them **in your bag** with sound off.

12.2 Academic Dishonesty

All students are expected to comply with the Georgia Tech Honor Code (see http://www.policylibrary.gatech.edu/student-affairs/code-conduct). Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. Cheating includes but is not limited to the following.

Using a calculator, cell phone, books, or any form of notes on exams.

Copying directly from **any** source during an exam, including friends, classmates, or a solutions manual.

Allowing another person to copy your work. Taking a test using someone else's name, or having someone else take a test in your name.

Asking for a re-grade of a paper that has been altered from its original form.

Using someone else's name to gain participation points for them, or to take tests for them, or asking someone else to use your identity for any graded or participation submission.

12.3 Students with Disabilities and/or in need of Special Accommodations

Georgia Tech complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you are in need of classroom or testing accommodations, please make an appointment with the ADAPTS office to discuss the appropriate procedures. More information is available on their website, http://www.adapts.gatech.edu

13. Campus-Wide Dates

Jan 8 2025 (Wednesday) First day of class

Feb 14 – Feb 23 2025 Fall Break

April 22 2025 Final Instructional Class days

April 23 Reading Day

April 24 – April 30 Final Exams Session

For further information on campus-wide dates see http://www.registrar.gatech.edu/calendar

The date and time of the final exam is scheduled by the registrar.

For **final exam schedules**, see http://www.registrar.gatech.edu/students/exams.php.

14. TENTATIVE SCHEDULE

Week and Dates	Section Coverage in Lecture	Tests	Registrar
Week 1 Jan 8 – 10	1.1, 1.2, 1.3		First day of Class on Jan. 8
Week 2 Jan 13 – 16	2.1, 2.2, 2.3, 2.4	Quiz 1	Quiz 1 on Thu Jan 16 HW 1 due Jan 15
Week 3 Jan 20 – 23	2.5, 2.6, 2.7		HW 2 due Jan 22
Week 4 Jan 27 – 30	(3.1) 3.2-6.1-6.2, 3.3-6.3	Quiz 2	Quiz 2 on Thu Jan 30 HW 3 due Jan 29
Week 5 Feb 3 – 6	3.3-6.3, 3.4-6.4		HW 4 due Feb 5
Week 6 Feb 10 – 13	3.4-6.4, 3.5	Mid 1	Mid 1 on Thu Feb 13 HW 5 due Feb 12
Week 7 Feb 14 – 23	NO CLASS	NO CLASS	SPRING BREAK
Week 8 Feb 24 – 27	4.1, 4.2		HW 5 due Feb 26
Week 9 Mar 3 -- 6	4.3, 4.5, 4.7	Quiz 3	Quiz 3 on Thu Mar 6 HW 6 due Mar 5
Week 10 Mar 10 -- 13	4.4, 4.6, 5.1		HW 7 due Mar 12
Week 11 Mar 17 -- 20	5.2, 5.3, 5.4	Mid 2	Mid 2 on Thu Mar 20 HW 8 due Mar 19
Week 12 Mar 24 – 27	5.5, 5.6		HW 9 due Mar 26
Week 13 Mar 31 – April 3	5.7, 5.8, 7.1	Quiz 4	Quiz 4 on April 3 HW 10 due April 2
Week 14 April 7 – 10	7.2, 7.3, 7.4		HW 11 due April 9
Week 15 April 14 – 17	8.1, 8.2, 8.3	Quiz 5	Quiz 5 on April 17 HW 12 due April 16
Week 16 April 22	Last day of class		April 21 Easter HW 13 due April 22

Please use this as an approximate class schedule. Section coverage may change depending on the flow of the course.