

MATH 2552 DIFFERENTIAL EQUATIONS

GEORGIA TECH LORRAINE

COURSE SYLLABUS

Welcome to Differential Equations!

All of 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: To be announced

Recitation Meeting times: To be announced

2. Instructor and TA Contact Information

Instructor: Dr. Salah MEHDI

Office: To be announced

Office Hours: To be announced

E-mail: salah.mehdi@univ-lorraine.fr (preferred address) or salah.mehdi@gatech-metz.fr

Teaching Assistant: To be announced

Office: To be announced

Office Hours: To be arranged with TA

E-mail: To be announced

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. Assessments & Information

Assessments: Quizzes and Midterms will be returned in class.

Information: Announcements and course-related documents will be sent by email.

5. Grades

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

Assessment	Weight 1	Weight 2
Participation	2%	2%
Quizzes	18%	18%
Midterms	45%	35%
Final Exam	35%	45%

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. You will be guaranteed a minimum of the following grading scale, but do not expect any adjustments. Any changes to these intervals would only be made after the final exam.

Midterm grades will be assigned on **October 1**. A satisfactory grade will be assigned to all students with a midterm average of 70% or higher (based on 90% midterm grade and 10% quiz grade).

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 outcomes for this course include 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

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 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 Midterms and the Final Exam

Practice materials and additional office hours will be offered prior to midterms and the final exam. 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, Midterms, Final Exam Policies

9.1 Homework

Homework are assigned exercises from the textbook and will not be collected. You are expected to understand all homework problems for all midterms and the exam. In order to increase the effectiveness of lectures, you should attempt problems before lectures.

9.2 Participation

The purpose of participation activities is to encourage participation and active learning, foster community among students, offer feedback to the instructor on student understanding and course activities, and help students become more aware of their level of understanding of course material. Participation activities will be held during lecture and recitation sessions. Participation activities will not be held in the first and last weeks of the course, and will only be graded for completion (not for accuracy). Participation activities could include activities such as individual problem solving, practice quizzes, group work activities, and surveys.

9.2 Midterm Schedule and Topics

We will have 50-minute midterms. Tentative dates are on the last page of the syllabus. Unless stated otherwise, midterms cover the following sections.

- Midterm 1: Covers Chapter 1, Chapter 2, 3.1-3.5 and 6.1-6.4
- Midterm 2: Covers 3.6, Chapter 4 and 5.1-5.4

9.4 Midterm and Final Exam Procedures

9.4.1 Midterm and Final Exam Procedures

- Books, notes, cell phones, and calculators are not allowed during midterms and the final exam.
- Students may have something to write with and an eraser when taking midterms and the final.
- 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 midterm and the final exam.
- Unless indicated otherwise, students must adequately justify their reasoning for full marks.
- Marks can be taken off in a midterm or final exam for not using the correct notation.
- The midterms and the final exam are comprehensive.
- Students who are unable to take any midterms or the final exam for any reason are responsible for notifying their instructor prior to the exam and as soon as possible.
- Midterms will be returned to students through the Crowdmark system. Further details about Crowdmark will be given in lecture.

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>

9.4.3 Re-grade Requests for Midterms and Quizzes

- 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 quiz or midterm, 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! In general, no make-up exams will be given and any missed exam results in a "0" score.

- If you have a valid reason to request a make-up exam, please contact Dr. Mehdi 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 Dr. Mehdi 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.
- Please, refrain from using laptops, they are a distraction to others.
- Please do not bring food to eat during lectures, eating is a distraction to others.

12.2 Academic Dishonesty

All students are expected to comply with the Georgia Tech Honor Code (the honor code can be found at <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

(please check with Registrar for possible updates)

08 18 2020 First day of class

09 28 2020 Progress report due

10 24 2020 Withdrawal deadline: last day to withdraw with a grade of "W"

10 26-30 2020 Fall Break

11 30 - 12 1 2020 Final Instructional Class days

12 2 2020 Reading period

12 3-10 2020 Final Exams period begins

12 14 2020 Grade submission deadline (noon, Atlanta time)

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

Please use this as an approximate class schedule. Section coverage may change depending on the flow of the course. (Quizzes will take place during recitations, while Midterms will be during lectures.)

Week and Dates	Section Coverage in Lecture	Quizzes, Midterms	Registrar
Week 1 Aug 18 - 21	1.1, 1.2, 1.3		
Week 2 Aug 24 - 28	2.1, 2.2, 2.3, 2.4		
Week 3 Aug 31- Sep 4	2.5, 2.6, 2.7	Quiz 1	
Week 4 Sep 7 - 11	3.1, 3.2, 6.1		Verif. of Participation Due Sep 11
Week 5 Sep 14 - 18	3.3, 6.2, 6.3	Quiz 2	
Week 6 Sep 21 - 25	3.4, 6.4, 3.5		
Week 7 Sep 28 - Oct 2	3.6, 4.1, 4.2	Midterm 1	Progress Report Due Sept 28
Week 8 Oct 5 - 9	4.3, 4.5, 4.7		
Week 9 Oct 15 - 19	4.7, 4.4	Quiz 3	
Week 10 Oct 12 - 16	4.6, 5.1, 5.2		Withdrawal Deadline Oct 24
Week 11 Oct 19 - 23	5.3, 5.4	Quiz 4	
Week 12 Oct 26 - 30	NO CLASS	NO CLASS	FALL BREAK
Week 13 Nov 2 - 6	5.5, 5.6		
Week 14 Nov 9 - 13	5.7, 5.8, 7.1	Midterm 2	
Week 15 Nov 16 - 20	7.2, 7.3, 7.4		
Week 16 Nov 23 - 27	8.1, 8.2, 8.3	Quiz 5	
Week 17 Nov 30 - Dec 1	Review for Final Exam	Final Instructional Days	Last day of class is Dec 1
Week 18 Dec 3 - 10	Finals		