

**MATH 2552 DIFFERENTIAL EQUATIONS**

GEORGIA TECH EUROPE

**COURSE SYLLABUS**

**Updated on Jan 25 2025**

Welcome to Differential Equations!

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



**Course Title:** Differential Equations

**Course Meeting Times:** M, W : 11:00 – 12:15 in Yellow Room

**Studio Meeting times:** TBA

**Instructor and Teaching assistant**

**Instructor:** Hyun Jeong KIM

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**Office:** 103B   **Office Hours:** TBA

**Teaching Assistant:** TBA,      **E-mail:** TBA,

**Office:** TBA,    **Office Hours:** TBA

### 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.

### Pre- &/or Co-Requisites

MATH 1502 OR MATH 1512 OR MATH 1555 OR MATH 1504 ((MATH 1552 OR MATH 15X2 OR MATH 1X52) AND (MATH 1522 OR MATH 1553 OR MATH 1554 OR MATH 1564 OR MATH 1X53)).

We will need to do a lot of calculus (differentiation and integration) and linear algebra (solving linear systems and computing eigenvalues and eigenvectors).

### Office Hour and Help Desk

To get help with our course materials, use the office hour of myself and TA. If you need help outside office hours, make appointment with me by email.

For those who need help with prerequisite materials such as College algebra, Precalculus and Calculus, a few sessions or more with Help Desk will be suggested.

### Tips for Success

To succeed in Math class, the minimum work you need to do is : Read Course Slides and review examples done in class thoroughly. Review examples done in Studio. Do homework and practice with suggested extra problems from our textbook.

Most importantly, as soon as you find the course a bit challenging, **you should use office hours regularly not to get behind.**

### Communication

Announcements, course-related documents and homework assignments will be posted on **Canvas**.

### Topics and Learning Outcomes

**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:

- First Order Differential equations

- Systems of two first order equations
- Second order linear equations
- Modelling real-life situations
- Laplace Transform Methods
- Nonlinear Differential Equations and Stability
- Numerical approximation of solutions by Euler's method

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 visually (for example, by using a direction field or a phase portrait).
- **Write** logical progressions of precise mathematical statements to justify and communicate your reasoning.

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

## Expectations

### 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.

### 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.

### 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.

## 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.

## Homework, Participation, Tests Policies

**HOMEWORK** : Weekly Homework will be assigned on **Webwork** due every Wednesday 11:59pm. You are expected to understand all the homework problems for all the tests. **No late submission is allowed. Two lowest HW scores will be dropped.**

For extra practice besides Webwork assignments, there will be suggested problems from Textbook posted on Canvas. These are NOT going to be collected for grading, but it is strongly recommended to do the problems after each lecture.

**PARTICIPATION: Attending class is important.** Class attendance 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%. **Late arrivals and early departures without proper excuse will be also noted.**

**QUIZZES:** There will be **five** quizzes of 20 minutes during Studio on **Thursday**. Tentative dates are **Aug 28, Sep 11, Oct 9, Oct 23 and Nov 27**. **One lowest quiz score will be dropped.**

**MIDTERMS:** There will be **two** midterms of 1h 15 minutes during Lecture on **Wednesday**. Tentative dates are **Sep 24 and Nov 12**. 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**.

### 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.
- 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 and Solutions will be posted on Canvas.

### 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.

## Grades

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

Assessment	Weight 1	Weight 2
Participation	2%	2%
12 best Homework	5%	5%
4 best Quizzes	23%	23%
2 Midterms (Better midterm 65% + The other 35%)	30%	40%
Final Exam	40%	30%

A **midterm grade** will be assigned by Feb 24 for Progress Report . A satisfactory grade will be assigned to all students with a midterm average of 70% or higher.

For **Final grade**, 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. There will No change to these intervals as there will be an appropriate curve after each test when necessary. Please do NOT ask for extra credit near or after the final exam.

### 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".

- In the case of illness and emergency, please contact me as early as possible.
- 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.

### Class Policies

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**. If you need to leave the class early, please let me know at the beginning of the class.
- 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.** These are distractions for yourself and your classmates. Please keep them **in your bag** with sound off.
- **No Food allowed in Classroom.** This is a strict rule at GT-Europe.

### 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.

### 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>

### Campus-Wide Dates

Aug 20 2025 (Wednesday) First day of class

Oct 27 – Nov 02 2025 Fall Break

Dec 01, 02 2025 Final Instructional Class days

Dec 03 2025 Reading Day

Dec 04, 12 2025 Reading periods 8:00 am to 2:40 pm

Dec 04 - 12 2025 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 Aug 20 – 22	1.1, 1.2, 1.3, 2.1		First day of Class on Aug. 20 Class on Friday exceptionally
Week 2 Aug 25 – 28	2.2, 2.3, 2.4	Quiz 1	Quiz 1 on Thu Aug 28 HW 1 due Aug 27
Week 3 Sep 1 – 4	2.5, 3.1-2, 6.1-2		HW 2 due Sep 3
Week 4 Sep 8 – 11	3.3-6.3, 3.4-6.4	Quiz 2	Quiz 2 on Thu Sep 11 HW 3 due Sep 10
Week 5 Sep 15 – 18	3.5, Shifted Systems		HW 4 due Sep 17
Week 6 Sep 22 – 25	4.1-2, Midterm	Mid 1	Mid 1 on Wed Sep 24 HW 5 due Sep 24
Week 7 Sep 29 – Oct 2	4.3, 4.5		HW 6 due Oct 1
Week 8 Oct 6 – 9	4.7, 4.4	Quiz 3	Quiz 3 on Thu Oct 9 HW 7 due Oct 8
Week 9 Oct 13 – 16	4.6, 5.1-2		HW 8 due Oct 15
Week 10 Oct 20 – 23	5.3-4, 5.5	Quiz 4	Quiz 4 on Thu Oct 23 HW 9 due Oct 22
Week 11 Oct 27– Nov 2	NO CLASS	NO CLASS	FALL BREAK
Week 12 Nov 3 – 6	5.6, 5.7		HW 10 due Nov 5
Week 13 Nov 10, 12 – 14	5.8, Midterm	Mid 2	Nov 11(Tue) Bank Holiday Nov 14 (Friday) Studio Mid 2 on Nov 12 HW 11 due Nov 12
Week 14 Nov 17 – 20	7.1-4		HW 12 due Nov 19
Week 15 Nov 24 – 27	8.1-2, Review	Quiz 5	Quiz 5 on Nov 27 HW 13 due Nov 26
Week 16 Dec 1 – 2	Last day of class, Review		HW 14 due Dec 3

