Course Description: This is a first course in Ordinary Differential Equations. The material includes: techniques for solving first order ODE’s (including systems); visualization and qualitative study of dynamical systems; the Laplace and Fourier transforms; introduction to PDE’s through heat and wave equations.

Teaching Staff: All times are in California time

Instructor: Umut Varolgunes
E-MAIL: umutvg@stanford.edu

TA: Panagiotis Lolas
E-MAIL: panagd@stanford.edu
Office Hours: TTh 10-12pm and W 2-3am

TA: Sanchit Chaturvedi
E-MAIL: sanchat@stanford.edu
Office Hours: TTh 3-5pm + T 10-11am

Lectures & Sessions: All times are in California time

Lectures: (Pre-recorded) 25 minute lectures released by 2 minutes before MWF 00:01am

Student activity sessions: (Breakout rooms with instructor drop-ins - not recorded)
MWF 10:00-10:25am and 11:00-11:25am | live via Zoom

TA Sessions Problem sheets released MW; pre-recorded videos of TA’s solving these problems released TTh.

Learning goals: Handwritten learning goals (covering a week) that were used for preparing lectures will be uploaded on Fridays (Wednesdays on exam weeks).

Instructor answers to emails: You can email Umut questions throughout the week and he will choose some of them by California time Saturday morning (Thursday morning for exam weeks), and post the answers on the course website on Sunday (Thursday if exam week) in a pdf document (the identities of the askers will not be revealed).

***** the subject line has to be: ”Math 53 Question Week x” *****

Please first try all the other ways to get answers to your questions (office hours, looking to your book, asking a peer...) and if none of these work, then email the question. Vague or unclear questions will not be answered. Organizational questions are ok. Feel free to retract your questions if you find your answer in the meantime.

Exams: There will be three take home midterm exams (see below for more instructions)

Midterm #1: Friday, May 1 (2 hours)
Midterm #2: Friday, May 22 (2 hours)
Midterm #3: Friday, June 5 (1 hour)
Prerequisites: Single Variable Calculus (Math 19-20-21, or 41-42, or equivalent); Linear Algebra and Multivariable Calculus (Mathematics 51 or equivalent)


Course website: Course announcements, homework, solutions will be posted on http://web.stanford.edu/class/math53/.

Grading Policy: The weekly homework and exams are weighted as follows:

- Homework: 50%
- Midterms: first two 20% each, third 10%

Passing Policy Above 70 percent is a guaranteed pass.

Homework: The only way to learn mathematics is to do mathematics! I encourage you to form study groups and work together. A good strategy is to try each problem yourself first, then get together with others (online! - for now) to discuss your solutions and questions, and finally write up the solutions yourself. Please work out problems neatly—don’t hand in your scratch work. One course goal is to sharpen your mathematical writing skills, and homework is a place to practice.

Weekly homework assignments are to be turned in on Gradescope by Thursday midnight. The assignments will be posted on the course website the previous Wednesday. No homeworks due on exam weeks. The homework that is assigned on a week previous to an exam will be due in two weeks.

The lowest score will be dropped to accommodate exceptional situations such as a serious illness. Because the lowest score is dropped, you can miss one assignment without penalty. No late homework will be accepted, and no make-up homework will be given.

Midterm Policy:

- These will be released at the same time and instead of the regular video lecture of that Friday.
- They will all be open book/computer/... exams. You will have to submit your solution set within 24 hours of the release.

Schedule: This course is structured with the expectation that you will watch every lecture within 24 hours of its release. Each student is allowed to attend only one of the student activity sessions per lecture day. To participate in the student activity session it is mandatory that you watch the corresponding lecture before. We will have 30 lecture days in total, 3 of which will be used for midterms.

The course will consist of five parts which are:

- Introduction to differential equations (1 week)
- Techniques for solving first order differential equations (3 weeks)
- Dynamical systems (3 weeks)
- Laplace and Fourier transforms (2 weeks)
- Examples of PDEs (1 week)

\textsuperscript{*}please contact me if you need assistance with having access to this book
A more detailed schedule along with references to the textbook will be made available in the course website as the quarter progresses.

**Students with Documented Disabilities:** Students who may need an academic accommodation based on the impact of a disability must initiate the request with the Office of Accessible Education (OAE). Professional staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter for faculty dated in the current quarter in which the request is made. Students should contact the OAE by the end of the first week of the quarter, since timely notice is needed to coordinate accommodations. The OAE is located at 563 Salvatierra Walk (723-1066, studentaffairs.stanford.edu).

**Textbook and other Resources:** The primary textbook is *Differential Equations: An Introduction to Modern Methods and Applications (3rd edition)* by Brannan and Boyce. The textbook is of high quality, and you should read it. This does not mean that it is “easy” to read. Math books are quite demanding on the reader, owing to the intrinsic difficulty of the material, so do not be surprised if you have to go slowly.

You are encouraged to attend the office hours provided by the instructor and teaching assistants. You may attend the office hours of either teaching assistant.

The Stanford University Mathematics Organization (SUMO) tutoring will take place online at [https://stanford.zoom.us/j/490918772](https://stanford.zoom.us/j/490918772) 6PM-10PM (UTC-7, Stanford time) Monday through Thursday April 13 through June 9. Authentication required (only users with .stanford.edu are admitted), no password required. Students will be admitted via waiting room.

The Center for Teaching & Learning (CTL) offers appointment and drop-in tutoring for Math 53, in addition to tutoring for a number of other courses. For more information and to schedule an appointment, visit our [tutoring appointments and drop-in schedule page](https://communitystandards.stanford.edu) (embedded link). We also have a variety of [remote learning resources](https://vaden.stanford.edu/caps-and-wellness) (embedded link) and [academic coaching](https://vaden.stanford.edu/caps-and-wellness) (embedded link) available to assist with all of your learning needs!

Another resource which may be of use is Counseling and Psychological Services. See [vaden.stanford.edu/caps-and-wellness](https://vaden.stanford.edu/caps-and-wellness).

**Academic Integrity:** The Honor Code articulates Stanford University’s expectations of students and faculty in establishing and maintaining the highest standards in academic work. Examples of conduct that have been regarded as being in violation of the Honor Code (and are most relevant for this course) include copying from another’s examination paper or allowing another to copy from one’s own paper; plagiarism; revising and resubmitting a quiz or exam for regrading, without the instructor’s knowledge and consent; representing as one’s own work the work of another; and giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid was not permitted. See [communitystandards.stanford.edu](https://communitystandards.stanford.edu) for more information on the Honor Code.

**Important Dates:**

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First Day of Classes ............................................................... April 6
Add/Drop Deadline ............................................................... April 24
Course Withdrawal & Change of Grading Basis Deadlines .......... May 29
Last Day of Classes, Last Day to Arrange an Incomplete .......... June 12
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