

Math 20D
Introduction to Differential Equations
Summer Session I 2022 Syllabus (Lecture A00)

Instructor: Brian Tran (b3tran@ucsd.edu)

Course Times: See Course Schedule

Instructor Office Hours: See Course Schedule

TAs: Linhui Fu (15fu@ucsd.edu), Collin Cranston (ccransto@ucsd.edu)

TAs' Office Hours: See Course Schedule

Grader: TBD

SI Leader: Galen Ng (gng@ucsd.edu) - see SI Math 20D Canvas site for more info

Credit Hours: 4

Website: We will have two course websites: [Canvas](#), as well as <http://www.math.ucsd.edu/~b3tran/courses/math20d.html>. You are responsible for checking both regularly for announcements, assignments, etc.

Prerequisite: MATH 20C (or MATH 21C) or MATH 31BH with a grade of C- or better.

Catalog Description: Ordinary differential equations: exact, separable, and linear; constant coefficients, undetermined coefficients, variations of parameters. Systems. Series solutions. Laplace transforms. Techniques for engineering sciences. Computing symbolic and graphical solutions using MATLAB. (Formerly numbered MATH 21D.) May be taken as repeat credit for MATH 21D.

Textbook: R. Nagle, E. Saff, A. Snider. *Fundamentals of Differential Equations, 9th Edition*. Published by Pearson, 2018. You do NOT need an online access code for homework; we will have a traditional pen and paper homework format (see Homework section below).

Material: We will cover certain parts of chapters 1, 2, 4, 7, 8, and 9 of the text (see the Course Schedule for a more detailed breakdown). Note that I will also add material that is not necessarily in the text, so it is essential to attend/watch lectures, as well as reading the corresponding sections in the textbook (it is beneficial to read the textbook section before the corresponding lecture, as well as review it afterward). This is considered part of your responsibility in taking this course.

Lecture: TuTh 5 pm – 7:50 pm. Lectures will be given in-person at Solis Hall 104. Lectures will also be podcasted with video and audio recording so that synchronous attendance is not required for lectures, although encouraged (the course podcast can be found at https://podcast.ucsd.edu/watch/s122/math20d_a00). Please feel free to ask questions at any time during lecture. You may feel intimidated to ask a question, but you and your peers will benefit from you asking, so please ask.

Discussion Section: Wednesday and Friday (time depending on section number). Discussion sections are useful for discussing material and asking questions (e.g., about the lecture material or about the homework) directly with your TA. Attendance is not required for discussion, although encouraged. You may attend any of the discussion sections, A01, A02, or A03.

Office Hours: My and your TAs' office hours allow us to engage with you directly. These are here for your benefit, and you are highly recommended to make use of these resources. Attendance for

office hours is not strictly required, although encouraged. If you cannot attend our listed office hours, feel free to email me or your TAs and we can schedule an appointment at a different time.

Homework: There will be 4 homework sets, due each week on Wednesday at 11:59 pm. No late submissions will be accepted. The homework sets will be posted to both course websites and to Gradescope. The homework sets will consist of both textbook problems as well as problems that I will write; you are encouraged to discuss homework problems with me and your TAs during office hours and discussion sections. You may refer to your textbook (but do not plagiarize). However, you may not discuss or share answers with your peers, since working through the homework yourself is a fundamental part in learning the course material. Submitted homework must be your own original work. Make sure to include your full name, PID, and show all of your work. You will submit your homework on [Gradescope](#); after it is graded, you will be able to view the grade as well as any comments on Gradescope. There are two methods in which you can write and submit your homework:

- You can write out your solutions using a pen and paper. Subsequently, scan your work and submit it as a PDF file. If you choose this method, make sure that your work is neat and legible, as it is your responsibility to make sure that your work is readable by the grader. Alternatively, if you have a tablet and stylus, you can write out your solutions digitally, save your work as a PDF and submit it this way.
- You can type out your solutions electronically, with whichever software that you prefer (as long as the software has the capability of creating mathematical text and you must submit the file as a PDF). Two common choices are: Microsoft Word (using the Insert > Equations option for mathematical text; make sure to save your document as a PDF before submitting) and LaTeX. LaTeX is a typesetting software which allows you to create professional mathematical documents; it may seem difficult at first (its structure is similar to coding) but in my opinion, it is a worthwhile skill to learn, especially if you plan on continuing your career in the mathematical sciences. I have created a LaTeX homework template that you can use for your homework, if you'd like (see the course websites).

Term Paper: You are to write a short expository mathematical paper (3 page minimum) on a topic related to differential equations. The point of this paper is to allow you to adapt the course to your own interests and allow you to explore a topic outside of the material covered in class. There are a variety of topics that you could choose. The term paper instructions PDF posted on Canvas provides more detailed information regarding the term paper and suggests some possible topics, although you may choose your own. The paper should be typeset; for example, either using LaTeX or using Microsoft Word with the Insert > Equations for any mathematical text. I will be reading and grading these personally; if you make an honest effort, you will receive full credit for this portion of the grade. Due Date: Monday July 25th, 11:59 pm on Canvas under Assignments.

MATLAB: Please refer to UCSD's Math 20D MATLAB webpage <https://mathweb.ucsd.edu/~math20d/> for more information regarding the MATLAB portion of the course. There are four MATLAB assignments and one MATLAB quiz.

Exams: There will be one midterm which will be a 90-minute timed online exam. The midterms will be available to be viewed at the below dates on Gradescope. The exam will be available to be viewed on Gradescope for 12 hours from 12 pm in the afternoon to 11:59 pm midnight. Once you view the exam, the 90-minute timer begins; thus, for the full 90-minute time on the exam, begin the exam before 10:30 pm. You will have 90 minutes to complete, scan, and upload your exam to Gradescope. You should use about 80 minutes to work on the exam and 10 minutes to scan and upload the exam.

You can write out your solutions using pen and paper and scan it to submit as a PDF, or if you have a tablet and stylus, you can write out your solutions digitally, save it as a PDF, and submit it this way. You are allowed to have a single 8.5" x 11" sheet of notes (two-sided) for the midterm, but you may not use any other resources such as the textbook, calculators, or outside communication. Any form of academic dishonesty will be reported to the Academic Integrity Office.

The final exam will be a 180-minute proctored in-person exam. You may bring two 8.5" x 11" sheets of notes (two-sided) for the final, but no other resources will be allowed.

The final exam will be cumulative, in that it will require material covered throughout the course.

Important Dates:

- Midterm 1: Friday 07/15/22. Available on Gradescope 12 pm – 11:59 pm.
- Term Paper: Due Monday 07/25/22, 11:59 pm. Submit on Canvas under Assignments.
- MATLAB Quiz: Due Wednesday 07/27/22. See Math 20D MATLAB site.
- Final: Saturday 07/30/22, 7 pm – 9:59 pm. Location TBD (in-person).

Exam Regrade Policy: After receiving the grade for your exam on Gradescope, you can request a regrade on Gradescope for a given period of time. For a regrade request, we reserve the right to deduct or add points, so make sure that you are confident in any errors in grading.

Grading Policy: The course grade consists of the homework (30%) with the lowest homework dropped, Midterm (20%), MATLAB (10% = 6% MATLAB HW + 4% Quiz), Paper (10%), and the Final (30%). The grade scale will be:

A+	A	A-	B+	B	B-	C+	C	C-
97	93	90	87	83	80	77	73	70

I reserve the right to adjust this scale to be more lenient if warranted by the overall class performance.

Administrative Deadline: It is your responsibility to ensure that your exam and homework grades are correctly recorded on Gradescope. Contact your TA before the last week of instruction to resolve any errors.

Academic Integrity: Academic integrity is expected at UCSD and any academic dishonesty is a serious offense. Any students involved in academic dishonesty (including, but not limited to, utilizing outside resources, communicating, receiving, or sharing solutions) will face an administrative sanction, which may include a failing grade, suspension, or even expulsion. Please uphold your academic integrity; any academic dishonesty only undermines your and your peers' education. For more regarding academic integrity, please see UCSD's [Academic Integrity Website](#).