MATH N1B LEC 002 SYLLABUS

LEONARD TOMCZAK

Contents

1. General Information

Instructor: Leonard Tomczak

Office: Evans 835

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Office Hours: M, W, F, 11am-12pm (before lecture) in Evans 835.

Lecture location and time: M - F, 12pm-2pm, Haviland 12.

Required Textbook: Stewart, Single Variable Calculus (special UC Berkeley edition)

Course webgage: https://math.berkeley.edu/ ltomczak/1B_Summer25/1B.html.

2. Prerequisites

Math 1A or equivalent. In particular, you should be familiar with the following topics:

- Functions of a single variable, limits and continuity,
- Derivatives and how to use them to gain information about a function (maxima/minima, monotony, etc.),
- Integrals, relation to the area under a graph, fundamental theorem of calculus, some integration rules (e.g. substitution, linearity).

There is a review sheet with questions on the course webpage. If you can go through them without much trouble, that would be a good indicator that you are well prepared for the course.

3. Topics

The chapters refer to the class textbook.

- Chapter 7: Techniques of Integration.
- Chapter 8: Further Applications of Integration.
- Chapter 11: Sequences and Series.
- Chapter 9: Differential Equations.
- Chapter 17: Second-order Differential Equations.

The goal is to cover roughly one section in the book per day. The tentative weekly schedule is:

Week	Topics
1	Integration by parts, Trigonometric integrals, Trigonometric substitution, Partial fractions (7.1 - 7.5).
2	Numerical methods for computing integrals, Improper integrals, Arc Length, Surface area of surfaces of revolution (7.7, 7.8, 8.1, 8.2). Note: July 4 is a holiday.
3	Center of mass, Probability, Sequences, Series (8.3, 8.5, 11.1, 11.2). Note: Midterm 1 is on July 11.
4	Integral test, Comparison test, Alternating series, Absolute convergence, ratio/root test (11.3 - 11.7).
5	Power Series, Taylor series and polynomials (11.8 - 11.11).
6	Modeling with differential equations, Direction fields and Euler's method, Separable equations, Population growth models and first order linear equations (9.1 - 9.5). Note: Midterm 2 is on July 28
7	Continuation of first order linear equations, Predator-Prey Systems, Second-Order Linear Equations, Nonhomogeneous equations (9.5, 17.1, 17.2).
8	Applications of second order equations, Series solutions, Review (17.3, 17.4). Note: Final is on August 15.

4. Grading

The final grade is determined by the following components of the course: Weekly homework, weekly quizzes, two midterms, one final exam. In order to pass the course you have to take the final.

See the corresponding sections for details.

The total grade for the class is determined as follows: Homework counts 10%. The remaining 90% are made up of the quizzes, midterms and finals. The default weights are:

Quizzes	Midterm 1	Midterm 2	Final
20%	20%	20%	30%

However, there is a "clobber" policy: The final can replace either none, one, or both of the midterms, and half of the quiz score. Thus, if $\mathrm{HW}, \mathrm{Q}, \mathrm{M1}, \mathrm{M2}, \mathrm{F}$ denote the homework, quiz, midterm 1, midterm 2, final score respectively, the total grade is determined by the following formula:

$$\begin{aligned}\text{TotalGrade} = \mathrm{HW} \cdot 10\% \\ &+ (\mathrm{Q} \cdot 10\% + \max\{\mathrm{Q}, \mathrm{F}\} \cdot 10\%) \\ &+ \max\{\mathrm{M1}, \mathrm{F}\} \cdot 20\% \\ &+ \max\{\mathrm{M2}, \mathrm{F}\} \cdot 20\% \\ &+ \mathrm{F} \cdot 30\%\end{aligned}$$

The idea is that if you fall behind in the middle of the course or miss a midterm due to sickness, you can make up for it in the end by performing well on the final. The quiz score will always count at least 10% towards the final grade and the final at least 30%.

5. Homework

There will be 8 homework sets, generally due Mondays 23:59pm on Gradescope, covering the previous week's lecture content. The only exception is the last homework, which is due on the last day of instruction, August 15. Homework will be graded by completion. This means you will receive full credit as long as you completed every problem, even if you did not get the right answer. Note that you are still required to fully attempt the problem, in particular your submissions should include intermediate steps and computations, rather than just the final answer. If you do not show adequate work, the reader may deduct points. There will be no homework drops.

The Gradescope submission window closes promptly on time. You should not wait until the last minute to upload your submission in case you encounter "technical difficulties". While I plan to accept late homework within reason, this should not become a regular occurrence, and if it seems like students abuse this policy, this may be changed. Given the fast pace of summer sessions it is in your own interest to do the homework on time and to not fall behind.

Practically the whole course is about computation, so in order to do well on the exams you should do a lot of practice problems. I plan to assign about 2-3 problems per section in the book for homework. This is not a lot, therefore you should work on other problems in the book yourself, in particular in those sections you might have more difficulty with. We can talk about additional problems in the discussion section part of the class meeting or in office hours.

6. Quizzes

Starting in the first week there will be regular quizzes on every Thursday. The quizzes will cover the previous week's material, except for the first quiz (on June 26): This quiz will be about Math 1A material (see e.g. the review sheet on the website) and is mainly intended as a way for you to figure out if you have the necessary background for the class. Since this is technically testing material not covered in the class, you will get an additional quiz drop.

Thus, there are $8 = 7 + 1$ quizzes. In total you will have two ($=1 + 1$, one for the first extra quiz) quiz drops, meaning the two lowest quiz marks will be disregarded for the final grade computation.

You may bring one $8.5'' \times 11''$ sheet of handwritten notes into the quizzes. Besides this no other resources are allowed.

7. Exams

There will be two midterms and one final exam:

	Date	Topics
Midterm 1	July 11	Chapters 7, Chapter 8
Midterm 2	July 28	Chapter 11
Final	August 15	Everything

Note that you may still need some things from pre midterm 1 content for midterm 2 (e.g. improper integrals for the integral comparison test). You **have to** take the final in order to pass the class.

There are **no alternate exam times** and **no make up exams**.

You may bring one $8.5'' \times 11''$ sheet of handwritten notes into the exams. Besides this no other resources are allowed.

8. Lecture and Office Hours

On weekdays we meet from 12:10pm (Berkeley time) to 2pm. Roughly, the first hour will be lecture, followed by discussion/office hour. In addition to that, I will hold office hours in Evans 835 Mondays, Wednesdays, Fridays, from 11am - 12pm before lecture.

9. Attendance

Lecture attendance is not mandatory, but highly recommended. It is your responsibility to keep up with the material.

10. Accessibility and Accommodations

UC Berkeley is committed to creating a learning environment that meets the needs of its diverse student body. If you have a disability, or think you may have a disability, you can work with the Disabled Students' Program (DSP) to request an official accommodation. The Disabled Students' Program (DSP) is the campus office responsible for authorizing disability-related academic accommodations, in

cooperation with the students themselves and their instructors. You can find more information about DSP, including contact information and the application process here.

Please let me know as soon as possible if you require any type of accommodation and have the DSP office send official letters to me. Without an official DSP letter, accommodations cannot be guaranteed. Failure to communicate any needs in a timely manner may result in you having to take examinations without accommodations.

11. Incompletes

An incomplete grade is only given in very rare cases. Campus policy states that students cannot have an incomplete grade assigned to avoid an undesirable final grade. The grade 'I' may only be assigned if a student's work in a course has been of passing quality, but is incomplete for documented reasons beyond the student's control.

12. Academic Integrity

The following statements are taken from here.

You are a member of an academic community at one of the world's leading research universities. Universities like Berkeley create knowledge that has a lasting impact in the world of ideas and on the lives of others; such knowledge can come from an undergraduate paper as well as the lab of an internationally known professor. One of the most important values of an academic community is the balance between the free flow of ideas and the respect for the intellectual property of others. Researchers don't use one another's research without permission; scholars and students always use proper citations in papers; professors may not circulate or publish student papers without the writer's permission; and students may not circulate or post materials (handouts, exams, syllabi–any class materials) from their classes without the written permission of the instructor.

Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor. In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. If you are not clear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor beforehand. Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. The consequences of cheating and academic dishonesty—including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school—are simply not worth it.

Anyone caught cheating on a quiz or exam will receive a failing grade and will also be reported to the University Office of Student Conduct. In order to guarantee that you are not suspected of cheating, please keep your eyes on your own materials and do not converse with others during the quizzes and exams.

13. Emergencies

If the conditions require it (e.g. bad air quality), we will continue lectures over Zoom. The examinations and grading may be modified appropriately at the discretion of the instructor as well.

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