

Math 31B (Section 1/4), Winter 2020: Integration and Infinite Series

Mon, Wed, Fri 10-10:50am/3-3:50pm
on Zoom 986 6554 8257

Prerequisites

- You are expected to be familiar with polynomials, trigonometric functions, exponential and logarithm functions; namely, computing with these functions and knowing their graphs.
- You are expected to be familiar with materials in Math 31A, including (1) definition and computation of limits, (2) definition and computation of differentiation using techniques such as product rule, quotient rule and chain rule (3) definition and computation of integrals using fundamental theorem of calculus or change of variable technique (4) summation notation.

Learning Goals

- You will learn differentiation and integration with exponential, logarithm, and inverse trigonometric functions. You will learn integration techniques such as integration by parts and partial fractions. You will also learn concepts of sequences, series, their convergence, as well as how they intertwine with derivatives and integrals.
- You will improve habits of thinking about mathematics, including sensitivity of the assumptions which make a theorem or technique applicable, ability to make connections among topics, and confidence to tackle unfamiliar problems by beginning with easier examples.
- You will acquire a foundation in calculus that will serve you well in your future study of mathematics, sciences, engineering, or the social sciences.

Instructor

Chi-Yun Hsu

Contact: Use Piazza instead of email to contact me to avoid your messages being missed, see below.

Office Hours: Mon. 11-12pm, Wed. 4-5pm, Sat. 8-9pm

Teaching Assistants

Kyle Gettig (kgettig@math.ucla.edu)

Section 1A: Tuesday 10-10:50am

Section 1B: Thursday 10-10:50am

Andrew Sack (andrewsack@math.ucla.edu)

Section 1C: Tuesday 10-10:50am

Section 1D: Thursday 10-10:50am

Joshua Kazdan (kazdan@math.ucla.edu)

Section 1E: Tuesday 10-10:50am

Section 1F: Thursday 10-10:50am

Bertrand Stone (bertrand.stone@math.ucla.edu)

Section 4A: Tuesday 3-3:50pm,

Section 4B: Thursday 3-3:50pm

Francis White (fwhite@math.ucla.edu)

Section 4C: Tuesday 3-3:50pm,

Section 4D: Thursday 3-3:50pm

Jiahan Du (jiahandu@math.ucla.edu)

Section 4E: Tuesday 3-3:50pm,

Section 4F: Thursday 3-3:50pm

Course website: <https://ccle.ucla.edu/course/view/21W-MATH31B-1> for both Lec 1 and 4

Textbook: Rogawski, *Calculus: Late Transcendentals, Single Variable Calculus*, 4th Edition

If you choose to use a different or older edition, you are responsible of doing the correct homework problems.

Course Discussion Forum on Piazza:

<http://piazza.com/ucla/winter2021/math31b1> or <http://piazza.com/ucla/winter2021/math31b4>

Please use Piazza instead of email to contact me. You are also encouraged to use Piazza to have online discussion with classmates on course materials, homeworks, or any other questions.

Grade

I will assign letter grades based on individual performance relative to the course goal, rather than the class rank. Namely if your performance deserves an A, then you will receive an A even if 50% of the class perform better.

I will compute a numerical score using the grading scheme below.

Homework	10%
Quiz	20%
Midterm 1	20%
Midterm 2	20%
Final Exam	30%

According to the Departmental policy, your actual letter grade will not be below the one converted from the numerical score above. The standard conversion is $A \geq 93\%$, $A- \geq 90\%$, $B+ \geq 87\%$, $B \geq 83\%$, $B- \geq 80\%$, $C+ \geq 77\%$, $C \geq 73\%$, $C- \geq 70\%$, $D+ \geq 67\%$, $D \geq 63\%$, $D- \geq 60\%$, $F < 60\%$. The grade A+ is optional at the university level. It is given only when there is truly exceptional overall performance, so the grade A+ will be scarce or non-existent.

Homework

I will assign homework problems from the textbook on the course website lecture by lecture, but homework is submitted on a weekly basis. The homework from the lecture on Mon, Wed, Fri is **due on Tuesdays 11:59pm the next week. When there is a quiz the next week, you do not need to submit homework.** As there will be quizzes in Week 2,4,6 you do not need to submit HW 1,3,5. It is better to do the homework problems after each lecture, rather than rushing to finish at one time.

Please scan your homework and submit to Gradescope. You are responsible for the eligibility of the scan. Even if the grader cannot read the scan, no resubmission will be accepted. A (anonymous) grader will grade the homework. For any question about the grading, simply submit regrade requests on Gradescope.

Late homework will NOT be accepted. To accomodate the strict policy, **the lowest homework score will be dropped.** On the other hand, if you are under emergency circumstances such as accident or severe sickness happened well before the deadline so that you cannot possibly have time to do the homework, you can let me know and ask for a deadline extension. However, the deadline extension request is only accepted before the deadline, and will only be granted for emergency circumstances.

Each homework submission is worth 10 points. The score will be based on both correctness and completeness. Two problems will be randomly chosen to be graded for correctness, each worth 3 points. And the overall completion is worth 4 points.

I encourage you to discuss homework problems with other students, either form a study group or use online discussion tools such as Piazza mentioned above. However, you must write up the solutions on your own, as writing helps you deepen your understanding. Apart from help from me

or TAs, you must acknowledge any collaborators or references at the top of your assignment.

Quizzes

There will be quizzes during discussion sections. There will be a total of 3 quizzes, on week 2,4,6. The quiz will be TWO randomly chosen problems (different for Tuesday and Thursday sections) from the homework assignment of the previous week, possibly with a change of numbers. **When there is a quiz in a particular week, you do not need to submit homework.** Namely, you do not need to submit HW 1,3,5.

The quizzes are designed to be finished in 10-15 minutes. On the week when there is a quiz, **you are allowed 25 minutes in a 24-hour window, beginning on Tuesday/Thursday 8am depending on your discussion section**, to finish the quiz and upload your answer onto Gradescope. The extra 10 minutes is for uploading, but if you have any technological difficulties during the quiz, you should contact your TA and me as soon as possible. Discussion sections will be looser when there is a quiz, to allow people to complete the quiz during the discussion section without spending extra time outside of classes on the quiz.

The lowest quiz score will be dropped.

Exams

There will be NO make-ups for missed Midterms. You must take the Final exam in order to pass the class. Make-ups for the Final exam are permitted only under exceptional circumstances.

It is Departmental policy that the Midterms and the Final Exam are designed as 1 and 3 hour exams, respectively, but are all given over a 24-hour period. Tentative exam dates are:

Midterm 1	Feb. 3 (Wed.) 8am - Feb. 4 (Thurs.) 8am	On Lecture 1-11
Midterm 2	Feb. 24 (Wed.) 8am - Feb. 25 (Thurs.) 8am	On Lecture 12-19
Final Exam	Mar. 13 (Sat.) 8am - Mar. 14 (Sun.) 8am	On Lecture 20-26 (more focused) and 1-19

Learning Resources

- Your fellow students: You are encouraged to form study groups with your classmates.
- Office hours: You do not need to make an appointment; just show up to ask any questions.

You are encouraged to make good use of these resources. At the same time, don't be too quick to run for help. Learning is challenging and takes time. You should not expect to solve every problem immediately. Try a couple of different approaches before asking for help. Often you learn the most from things you try that don't work!

Disabilities Requiring Accommodation

If you are already registered with the Center for Accessible Education (CAE), please request your Letter of Accommodation on the Student Portal. If you are seeking registration with the CAE, please submit your request for accommodations via the CAE website. Please note that the CAE does not send accommodations letters to instructors – you must request that I view the letter in the online Faculty Portal. Once you have requested your accommodations via the Student Portal, please notify me immediately so I can view your letter.

Students with disabilities requiring academic accommodations should submit their request for accommodations as soon as possible, as it may take up to two weeks to review the request. For more information, please visit the CAE.

Center for Accessible Education (CAE)
A255 Murphy Hall
www.cae.ucla.edu
(310) 825-1501

Statement on Sexual Misconduct

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at

CARE Advocacy Office for Sexual and Gender-Based Violence
1st Floor Wooden Center West
CAREadvocate@careprogram.ucla.edu
(310) 206-2465

In addition, Counseling and Psychological Services (CAPS) provides confidential counseling to all students and can be reached 24/7 at (310) 825-0768. You can also report sexual violence or sexual harassment directly to

University's Title IX Coordinator
2241 Murphy Hall
titleix@conet.ucla.edu
(310) 206-3417

Reports to law enforcement can be made to UCPD at (310) 825-1491.

Faculty and TAs are required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Coordinator should they become aware that you or any other student has experienced sexual violence or sexual harassment.

Tentative Calendar

	Monday	Wednesday	Friday
Week 1 (1/4-1/8)	1. Introduction (7.4 until just before PV)	2. Derivative of Exponential Function (7.1)	3. Inverse Functions (7.2)
Week 2 (1/11-1/15)	4. Logarithms and their Derivatives (7.3)	5. Logarithms and their Derivatives (cont'd) (7.3)	6. L'Hôpital's Rule (7.5)
Week 3 (1/18-1/22)	No class (Martin Luther King, Jr. Day)	7. Inverse Trig and Hyperbolic functions (7.6,7.7)	8. Integration by Parts (8.1)
Week 4 (1/25-1/29)	9. Trigonometric substitution (8.2, 8.3)	10. Method of Partial Fractions (8.4)	11. Arc Length and Surface Area (9.2)
Week 5 (2/1-2/5)	12. Numerical Integration (8.8)	13. Midterm 1 on Lec 1-11	14. Improper Integrals (8.7)
Week 6 (2/8-2/12)	15. Improper Integrals (cont'd) (8.7)	16. Sequences (11.1)	17. Sequences (cont'd) (11.1)
Week 7 (2/15-2/19)	No class (Presidents' Day)	18. Series (11.2)	19. Series with Positive Terms (11.3 until before Thm 4)
Week 8 (2/22-2/26)	20. Series with Positive Terms (cont'd) (11.3)	21. Midterm 2 on Lec 12-19	22. Absolute and Conditional Convergence (11.4)
Week 9 (3/1-3/5)	23. Ratio Test and Root Test (11.5)	24. Power series (11.6)	25. Taylor polynomial (11.7)
Week 10 (3/8-3/12)	26. Taylor Series (11.8)	27. Further topics (probability, differential equation) (9.1,10.1)	28. Review