MATH 1210-090 Calculus I, Fall 2025

Course Information: Math 1210 Calculus I is a 4 credit course.
Prerequisite Information: 'C' or better in (MATH 1050 AND MATH 1060) OR MATH 1080 OR ALEKS score of 76+ OR ACT Math score of 28+ OR SAT Math score of 650+ OR AP Calculus score of 3+ OR IB Math AA HL score of 4+ OR IB Math AI HL score of 5+
Course Description: Functions and their inverses, including exponentials and logarithms. An overview of techniques for computing limits. Derivative rules and differentiation of polynomial, rational, trigonometric, exponential, logarithmic, and inverse trigonometric functions. Geometric applications of the derivative, optimization problems, related rates, and L'Hopital's rule. Antiderivatives, the definite integral, the Fundamental Theorem of Calculus, and geometric applications of the definite integral.

Course Outcomes & Objectives: Upon successful completion of this course, a student should be able to:

1. Understand the relationship between a function and its inverse and how this relates to exponential and logarithmic functions.
2. Use limit laws to evaluate limits of the form 0/0 (that simplify), limits that go to (positive or negative) infinity, limits that don't exist and limits that are finite.
3. Apply the limit definition of derivative to compute derivatives of polynomials, rational functions, trigonometric and inverse trigonometric, exponential, and logarithmic functions; understand the definition of continuity and consequences.
4. Apply derivative rules to compute derivatives and higher order derivatives; perform implicit differentiation and related rates computations.
5. Use differentiation to find critical points and inflection points, the signs of the first and second derivatives, and domain and limit information to determine geometric attributes of the graph of $y = f(x)$.
6. Apply differentiation to optimization, linear approximation, and problems involving differentials; use L'Hopital's rule to compute indeterminate limits.
7. Compute indefinite integrals and find antiderivatives, including finding constants of integration given initial conditions.
8. Compute definite integrals using the definition for simple polynomial functions. Compute definite integrals using the power rule, u-substitution, and the Fundamental Theorems of Calculus.
9. Apply the definite integral to compute area between two curves and volumes of solids of revolutions.

Course Requirements: The following are the grade components and the percentage each contributes to a student's final grade:

- **Homework Assignments (35%)**- assignments will be due weekly
- **Midterm Exams (40%)**- There will be two 90-minute midterm exams throughout the semester. Exams will occur in week 6 and week 12.
- **Final Exam (25%)**- A 150-minute cumulative final exam will be given during final exam week.

Required Readings: *Calculus Early Transcendentals*, by Briggs, Cochran, Gillett, and Schulz (3rd edition)

University Policies:

Americans With Disabilities Act (ADA) The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability & Access (CDA). CDA will work with you and the instructor to make arrangements for accommodations. Prior notice is appreciated. To read the full accommodations policy for the University of Utah, please see Section Q of the Instruction & Evaluation regulations. In compliance with ADA requirements, some students may need to record course content. Any recordings of course content are for personal use only, should not be shared, and should never be made publicly available. In addition, recordings must be destroyed at the conclusion of the course. If you will need accommodations in this class, or for more information about what support they provide, contact: Center for Disability & Access (801-581-5020 `disability.utah.edu`), 162 Union Building, 200 S. Central Campus Dr., Salt Lake City, UT 84112

Safety at the U The University of Utah values the safety of all campus community members. You will receive important emergency alerts and safety messages regarding campus safety via text message. For more safety information and to view available training resources, including helpful videos, visit `safeu.utah.edu`. To report suspicious activity or to request a courtesy escort, contact: Campus Police & Department of Public Safety, 801-585-COPS (801-585-2677), `dps.utah.edu`, 1735 E. S. Campus Dr., Salt Lake City, UT 84112

Addressing Sexual Misconduct Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status, or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to university officials: Title IX Coordinator & Office of Equal Opportunity and Affirmative Action (801-581-8365 `oeo.utah.edu`), 135 Park Building, 201 Presidents' Cir., Salt Lake City, UT 84112 and/or Office of the Dean of Students (801-581-7066 `deanofstudents.utah.edu`), 270 Union Building, 200 S. Central Campus Dr., Salt Lake City, UT 84112

To file a police report, contact: Campus Police & Department of Public Safety (801-585-COPS (801-585-2677) `dps.utah.edu`, 1735 E. S. Campus Dr., Salt Lake City, UT 84112

If you do not feel comfortable reporting to authorities, the U's Victim-Survivor Advocates provide free, confidential, and trauma-informed support services to students, faculty, and staff who have experienced interpersonal violence. To privately explore options and resources available to you with an advocate, contact: Center for Student Wellness (801-581-7776 `wellness.utah.edu`), 328 Student Services Building, 201 S. 1460 E., Salt Lake City, UT 84112

Academic Misconduct It is expected that students comply with University of Utah policies regarding academic honesty, including but not limited to refraining from cheating, plagiarizing, misrepresenting ones work, and/or inappropriately collaborating. This includes the use of generative artificial intelligence (AI) tools without citation, documentation, or authorization. Students are expected to adhere to the prescribed professional and ethical standards of the profession/discipline for which they are preparing. Any student who engages in academic dishonesty or who violates the professional and ethical standards for their profession/discipline may be subject to academic sanctions as per the University of Utahs Student Code: Policy 6-410: Student Academic Performance, Academic Conduct, and Professional and Ethical Conduct. Plagiarism and cheating are serious offenses and may be punished by failure on an individual assignment, and/or failure in the course. Academic misconduct, according to the University of Utah Student Code: ...Includes, but is not limited to, cheating, misrepresenting ones work, inappropriately collaborating, plagiarism, and fabrication or falsification of informationIt also includes facilitating academic misconduct by intentionally helping or attempting to help another to commit an act of academic misconduct. For details on plagiarism and other important course conduct issues, see the U's Code of Student Rights and Responsibilities

https://regulations.utah.edu/academics/6-400.php

Preliminary Course Schedule: All homework due dates are Friday 11:59pm. Homework answers and the next assignment will be posted one hour after due date time.

Week 1 Homework demo assignment due Aug 22—learn to log in, navigate environment

Week 2 Assignment #1 due Aug. 29, Chapter 1.3, 1.4, 2.1: Inverses, Exponentials, and Logs **Note, Friday Aug. 29 is the last day to drop course**

Week 3 Assignment #2 due Sep. 5, Chapter 2.2-2.5: Limits.

Week 4 Assignment #3 due Sep. 12 Chapter 2.6-3.3: The derivative and derivative rules

Week 5 Assignment #4 due Sep. 19, Chapter 3.4-3.7: Trigonometric derivatives, chain rule

Week 6 Exam 1 (Sep. 23 - Sep. 26). Register for a time on Canvas.

Week 7 Assignment #5 due Oct. 3, Chapter 3.8-3.11: Implicit differentiation, related rates, exponential derivatives.

Week 8 Fall Break (Oct.6-Oct. 13)

Week 9 Assignment #6 due Oct. 17, Chapter 4.1-4.4: Maxima and minima, monotonicity and concavity, local extrema, Mean Value Theorem. **Note, Friday Oct. 17 is the last day to withdraw from course**

Week 10 Assignment #7 due Oct. 24, Chapter 4.5-4.8: optimization, linear approximation, L'Hopital's Rule

Week 11 Assignment #8 due Oct. 31, Chapter 4.9 & 5.1-2: Antiderivatives, definite integrals

Week 12 Exam 2 (Nov. 3 - Nov. 5). Register for a time on Canvas.

Week 13 Assignment #9 due Nov. 14, Chapter 5.3-5: Fundamental Theorem of Calculus, substitution, Integral Mean-Value Theorem

Week 14 Assignment #10 due Nov. 28, Chapter 6.1-2: Areas of plane regions, net change

Week 15 Assignment #11 due Dec. 5, Chapter 6.3-6.4: Volumes of solids

Week 16/17 Final Exam (Dec. 8 - 12). Register for a time on Canvas.

*****This syllabus is subject to change at the discretion of the instructor**

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