

# MATH 1210-015 Calculus I, Fall 2021

**Class Meetings** on MTWF at 11:50-12:40am in CTIHB 109.

**Lab Meetings:**

Section 016: Th at 11:50-12:40am JTB 120,  
Section 017: Th at 11:55-12:45am WBB 820,  
Section 040: Th at 11:50-12:40am AEB 350,  
Section 041: Th at 11:55-12:45am AEB 340.

**Instructor:** Carlos Ospina

**Email:** ospina@math.utah.edu

**Office Hours:**

Tuesday 2:00-3:00 pm JWB 221  
Thursday 2:00-3:00 pm JWB 221  
Office Hours on Zoom TBA

**Learning Assistant:**

TBA Labs 040 and 041  
TBA Labs 016 and 017.

**LA Office Hours:** TBA.

**Text:** *Calculus with Differential Equations*, by Varberg, Purcell, and Rigdon (9th edition)  
For information on purchasing the textbook, go to <http://www.math.utah.edu/schedule/bookInfo/>

**Course Information:** Math 1210 Calculus I is a 4 credit course.

**Prerequisite Information:** “C” or better in (((MATH 1050 AND 1060) OR MATH 1080 OR (MATH 1060 AND Accuplacer CLM score of 80+)) OR AP Calc AB score of 3+ OR Accuplacer CLM score of 90+ OR ACT Math score of 28+ OR SAT Math score of 630+.

**Course Description:** Functions and their graphs, differentiation of polynomial, rational and trigonometric functions. Velocity and acceleration. Geometric applications of the derivative, minimization and maximization problems, the indefinite integral, and an introduction to differential equations. The definite integral and the Fundamental Theorem of Calculus.

**Canvas:** Canvas will be used for posting course announcements, homework assignments, grades, files and any relevant supplementary material. You are also welcome to make use of the Canvas discussion board to discuss course problems or topics. You can access the Canvas page through CIS or by logging in at [utah.instructure.com](http://utah.instructure.com). Students should check the Canvas page regularly for course information and resources. Email notifications and correspondence will be sent to the student’s UMail address ([u-number]@utah.edu); this email account must be checked regularly.

**Grading:** The following are the grade components and the percentage each contributes to a student’s final grade:

- **Homework Assignments (12.5%)**- Roughly three textbook sections are due most Fridays(including days of exams, but not the week following) by midnight (11:59 PM) on Gradescope. The homework will typically cover material covered up to and including the preceding Monday. If you click on a homework assignment in the Assignments tab in Canvas, you will see the list of assigned problems.

Three of the problems will be selected for grading by the grader, each graded out of 5 points. There will also be 5 points given for completion. The lowest 4 homework scores will be dropped. No late homework will be accepted, unless accompanied by a doctor's note or other verification of extenuating circumstance.

- **Labs (12.5%)**- Every Thursday a Learning Assistant- (LA) directed lab section will be held. These lab sections will have smaller class sizes, consisting of working on lab worksheets in groups. The LA will be there to help guide students through the problems. The worksheets will typically be due at the end of the lab period. Half of the lab grade (about 6% of the total course grade) will be given for participation, the remaining grade (6% of the total course grade) will be based on the quality of the lab reports. The lowest 3 scores will be dropped.
- **Midterm Exams (50%, 16.6% each)**- Three 50-minute midterm exams will be given on select Fridays. A practice exam will be posted a week prior to the midterm that will cover the same material. Dates of the midterm exams will be Friday Sep. 17th, Friday Oct. 22nd, and Friday Nov. 19th.
- **Final Exam (25%)**- A two-hour comprehensive exam will be given. As with the midterms, a practice final will be posted a week prior. Our final exam is scheduled for Tuesday, December 14, 2021 10:30 am – 12:30 pm.

**Remark About Exams:** With an effort to be flexible this semester, there will be an opportunity to improve one of your midterm exam scores, that is, if you score higher on those sections on the final exam. I will go ahead and replace the score with the higher grade. Students with university excused absences (band, debate, student government, intercollegiate athletics) should make alternate arrangements with me as soon as possible if the absence interferes with any course components.

Final course letter grades will be determined as follows: If  $X$  is your course percentage weighted according to the above, then  $\{X \geq 88\% \Rightarrow A, X \geq 85\% \Rightarrow A-, X \geq 82\% \Rightarrow B+, X \geq 73\% \Rightarrow B, X \geq 70\% \Rightarrow B-, X \geq 67\% \Rightarrow C+, X \geq 58\% \Rightarrow C, X \geq 55\% \Rightarrow C-, X \geq 52\% \Rightarrow D+, X \geq 43\% \Rightarrow D, X \geq 40\% \Rightarrow D-, X < 40\% \Rightarrow E\}$ .

The instructor retains the right to modify this grading scheme during the course of the semester; students will, of course, be well notified of any adjustments.

### Additional Resources

- **Tutoring Center & Computer Lab**- There is free tutoring in the T. Benny Rushing Mathematics Student Center (room 155, the lower level between JWB and LCB), as well as a computer lab. For more information see <http://www.math.utah.edu/undergrad/mathcenter.php>
- **Private Tutoring**- ASUU Tutoring Center, 330 SSB. There is also a list of tutors at the math department office JWB 233.
- **Departmental Videos**- The math department has a full set of lecture videos which you are welcome to use to supplement our course material. These can be found at <http://www.math.utah.edu/lectures/>

**Calculators:** Calculators will not be allowed on exams. They may be used on homework, but you should still write out the details of your computation. It is in your best interest not to become too dependent on your calculator since they will not be allowed on exams.

**Expected Learning Outcomes:** Upon successful completion of this course, a student should be able to:

1. Take limits of algebraic and trigonometric expressions of the form  $0/0$  (that simplify), non-zero number over 0, including limits that go to (positive or negative) infinity, limits that don't exist and limits that are finite.

2. Use and understand the limit definitions of derivative for polynomial, rational and some trigonometric functions; understand the definition of continuity and consequences.
3. Differentiate all polynomial, rational, radical, and trigonometric functions and compositions of those functions; perform implicit differentiation and compute higher order derivatives.
4. Use differentiation to find critical points and inflection points, the signs of the first and second derivatives, and domain and limit information to determine vertical and horizontal asymptotes. Then use all of that information to sketch the graph of  $y = f(x)$ .
5. Apply differentiation to optimization, related rates, linear approximation, and problems involving differentials.
6. Compute indefinite integrals and find antiderivatives, including finding constants of integration given initial conditions.
7. Compute definite integrals using the definition for simple polynomial functions. Compute definite integrals using the power rule, basic u-substitution, and the Fundamental Theorems of Calculus.
8. Apply the definite integral to compute area between two curves, volumes of solids of revolutions, arc length, surface area for surfaces of revolution, and work problems.

**Student Responsibilities:** All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, and I will do so, beginning with verbal warnings and progressing to dismissal from and class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. <http://regulations.utah.edu/academics/6-400.php>

**ADA Statement:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.

**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 the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

**Student Names and Personal Pronouns:** Class rosters are provided to the instructor with the students legal name as well as Preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name

on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email [bpeacock@sa.utah.edu](mailto:bpeacock@sa.utah.edu) to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

**Wellness Statement:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at [www.wellness.utah.edu](http://www.wellness.utah.edu) or 801-581-7776.

**Safety Statement:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu).

**University Counseling Center** The University Counseling Center (UCC) provides developmental, preventive, and therapeutic services and programs that promote the intellectual, emotional, cultural, and social development of University of Utah students. They advocate a philosophy of acceptance, compassion, and support for those they serve, as well as for each other. They aspire to respect cultural, individual and role differences as they continually work toward creating a safe and affirming climate for individuals of all ages, cultures, ethnicities, genders, gender identities, languages, mental and physical abilities, national origins, races, religions, sexual orientations, sizes and socioeconomic statuses.

**Office of the Dean of Students** The Office of the Dean of Students is dedicated to being a resource to students through support, advocacy, involvement, and accountability. It serves as a support for students facing challenges to their success as students, and assists with the interpretation of University policy and regulations. Please consider reaching out to the Office of Dean of Students for any questions, issues and concerns. 200 South Central Campus Dr., Suite 270. Monday-Friday 8 am-5 pm.

**Student Success Advocates:** The mission of Student Success Advocates is to support students in making the most of their University of Utah experience ([ssa.utah.edu](http://ssa.utah.edu)). They can assist with mentoring, resources, etc. Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact a Student Success Advocate for support (<https://asuu.utah.edu/displaced-students>).

**Covid Information:** University leadership has urged all faculty, students, and staff to **model the vaccination, testing, and masking behaviors** we want to see in our campus community. These include: vaccination, masking indoors, and if unvaccinated, getting weekly asymptomatic coronavirus testing.

- **Vaccination**

- **Get a COVID-19 vaccination** if you have not already done so. Vaccination is proving highly effective in preventing severe COVID-19 symptoms, hospitalization and death from coronavirus. Vaccination is the single best way to stop this COVID resurgence in its tracks.
- Many in the campus community already have gotten vaccinated:
  - \* More than 80% of U. employees
  - \* Over 70% of U. students
- Visit <http://mychart.med.utah.edu/>, <http://alert.utah.edu/covid/vaccine>, or <http://vaccines.gov/> to schedule your vaccination.

- **Masking**

- While masks are no longer required outside of Health Sciences facilities, UTA buses and campus shuttles, **CDC guidelines now call for everyone to wear face masks indoors.**
  - \* Check the CDC website periodically for masking updates <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinatedguidance.html>
  - \* Treat masks like seasonal clothing (i.e. during community surges in COVID transmission, masks are strongly encouraged indoors and in close groups outside).

- **Testing**

- **If you are not yet vaccinated, get weekly asymptomatic coronavirus tests.** This is a helpful way to protect yourself and those around you because asymptomatic individuals can unknowingly spread the coronavirus to others.
  - \* Asymptomatic testing centers are open and convenient:
    - Online scheduling
    - Saliva test (no nasal swabs)
    - Free to all students returning to campus (required for students in University housing)
    - Results often within 24 hours
    - Visit [alert.utah.edu/covid/testing](http://alert.utah.edu/covid/testing)

- **Remember: Students must self-report if they test positive for COVID-19** via this website: <https://coronavirus.utah.edu/>.

- **Student Mental Health Resources**

- Rates of burnout, anxiety, depression, isolation, and loneliness have noticeably increased during the pandemic. If you need help, reach out for campus mental health resources, including counseling, trainings and other support.
- Consider participating in a Mental Health First Aid or other wellness-themed training provided by our Center for Student Wellness and sharing these opportunities with your peers, teaching assistants and department colleagues.

**Course Roadmap Week-by-Week:** Below is an outline of the sections and topic covered in this course. Schedule and lab topics subject to change.

**Week 1** Introduction, Chapters 1.1-1.3 (Lab: algebra review)

**Week 2** Chapters 0.7, 1.4, 1.5 (Lab: limit basics) **Note, Friday Sep. 3rd is the last day to drop**

**Week 3** Chapters 1.6, 2.1, 2.2 (Lab: limits and infinities)

**Week 4** Chapters 2.3, review, Exam 1 (Sep. 17) (Lab: exam review)

**Week 5** Chapters 2.4-2.6 (Lab: derivative as a limit)

**Week 6** Chapters 2.7-2.9 (Lab: derivative rules)

**Week 7** Chapters 3.1-3.3 (Lab: linearization and differentials)

**Week 8** Fall Break

**Week 9** Chapters 3.4, review, Exam 2 (Oct. 22) (Lab: exam review) **Note, Friday Oct. 22nd is the last day to withdraw**

**Week 10** Chapter 3.5-3.7 (Lab: optimization)

**Week 11** Chapters 3.8-4.1 (Lab: graphing functions & MVT)

**Week 12** Chapters 4.2-4.4 (Lab: antiderivatives and applications)

**Week 13** Chapters 4.5, 4.6, review, Exam 3 (Lab: exam review) (Nov. 19)

**Week 14** Chapters 5.1-5.2 (Lab: evaluating definite integrals)

**Week 15** Chapters 5.3-5.4 (Lab: applications of integration)

**Week 16** Chapter 5.5, review (Lab: final exam review)

**Week 17** Final Exam Tuesday, December 14, 2021 10:30 am – 12:30 pm

**Syllabus subject to change:** This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas.