

MATH 1210-001 Calculus 1, Spring 2018

Instructor: Dapeng Mu

Email address: mu@math.utah.edu (or send me emails on canvas)

Class Meetings: Lecture: MWF: 9:40 AM - 10:30 AM, in WEB L112

Also meets: Tue 9:40 AM - 10:30 AM in WEB L110

Lab Meetings: Section 1210-002: Thu at 8:35 AM - 9:25 AM in JWB 308

Section 1210-003: Thu at 9:40 AM – 10:30 AM in WEB L110

Office hours: TBA

Learning Assistant: Nicholas Adolph Yonkee (both section 002 and 003)

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. 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 (15%)- Roughly three textbook sections are due most Fridays at the beginning of class (including days of exams, but not the week following). 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 homework score will be dropped. Homework will only be accepted in class, no electronic copies. No late homework will be accepted, unless accompanied by a doctor's note or other verification of extenuating circumstance.
- Labs (15%)- 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. One third of the lab grade (5% of the total course grade) will be

given for attendance, the remaining grade (10% of the total course grade) will be based on the quality of the lab reports. The lowest lab score will be dropped.

- **Midterm Exams (45%, 15% each)**- Three 50-minute midterm exams will be given on select Fridays. You will have the whole class period to complete the exam. 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 February 2nd, Friday March 2nd and Friday April 6th.
- **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 Wednesday May 2nd 8:00 am – 10:00 am in WEB L112.

Final course letter grades will be determined as follows: If X is your course percentage weighted according to the above, then:

A: $X \geq 90\%$; A-: $X \geq 87\%$; B+: $X \geq 84\%$; B: $X \geq 75\%$; B- : $X \geq 72\%$; C+: $X \geq 69\%$; C: $X \geq 60\%$; C-: $X \geq 57\%$; D+: $X \geq 54\%$; D: $X \geq 45\%$; D- : $X \geq 42\%$; E: $X < 42\%$.

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**- University Tutoring Services, 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 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 sign 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 a curve, $y = f(x)$.
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 center of mass.

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/6400.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 UID card, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email 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 or 801-581-7776.

Course Roadmap Week-by-Week: Below is a coarse outline of the sections and topic covered in this course.

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 Jan 19th 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 (Feb 2nd) (Lab: exam review)

Week 5 Chapters 2.4, 2.5, 2.6 (Lab: derivative as a limit)

Week 6 Chapters 2.7, 2.8, 2.9 (Lab: derivative rules)

Week 7 Chapters 3.1, 3.2, 3.3 (Lab: linearization and differentials)

Week 8 Chapters 3.4, Review, Exam 2 (Mar 2nd) (Lab: exam review) **Note, Friday Mar 2nd is the last day to withdraw**

Week 9 Chapters 3.5, 3.6, 3.7 (Lab: optimization)

Week 10 Chapter 3.8, 3.9, 4.1 (Lab: graphing functions & MVT)

Week 11 Spring Break (Mar 18-25)

Week 12 Chapters 4.2, 4.3, 4.4 (Lab: antiderivatives and applications)

Week 13 Chapters 4.5, 4.6, Review, Exam 3 (April 7th) (Lab: exam review)

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

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

Week 16 Chapters 5.5, review (Lab: TBA)

Week 17 Final Exam Wednesday May 2nd 8:00 am – 10:00 am, in WEB L112.