Math 1210-019 : Calculus I, Spring 2021

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.*

Instructor	RK Yoon
Contact	Email : rkyoon@math.utah.edu Office Hours : TBA
Class Type	IVC (Interactive Video Conferencing) - synchronous online
Class Meetings	MTWF 11:50AM-12:40PM, Online Zoom URL : https://utah.zoom.us/j/91987440531 (Password : TBA)
Learning Assistant	Erik Merrell
LA's Contact	Email : u1263034@utah.edu Office Hours : TBA
Lab Meetings	Section 030 - Th 11:50AM-12:40PM, Online. Section 031 - Th 12:55PM-1:45PM, Online.
Textbook	**(1) Calculus with Differential Equations**, 9th edition, by Varberg, Purcell and Rigdon. ISBN: 0-13-230633-6. Further book info is found at http://www.math.utah.edu/schedule/bookInfo/ (2) Lecture Note which will be posted on Canvas.
Course Information	Math 1210 Calculus I is a 4 credit course.
Prerequisites	"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.
Technical Requirements	Students are expected to be computer literate, with the ability to **navigate Canvas and Zoom**. These skills are critical for accessing all features and resources of this course. For the online synchronous course components, a strong internet connection and adequate bandwidth is needed. Tests will be proctored using Zoom with video enabled, so students are required to have a working **webcam** Note that a phone with a webcame is sufficient if no laptop is available. For Assignments and at least Exams submission, students are strongly required to have a **scanner or alternative scanning apps** for smartphones. For technical assistance, review the Canvas Getting Started Guide for Students and/or contact TLT, Knowledge Commons.

Course Website

Canvas will be used for posting course announcements, assignments, grades, files and any relevant supplementary material. 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.

Additional Resources

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/math1210.php

Calculator

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.

COVID-19

Students must self-report if they test positive for COVID-19 via

coronavirus.utah.edu.

Grading

Grades for each student will be calculated using the following formula:

$$\begin{aligned} &\text{Homework } (15\%) + \text{ Labs } (10\%) \\ &+ \text{ 4 Exams } (3 \times 18 + 9 = 63\%) + \text{ Final Group Project } (12\%). \end{aligned}$$

1. Homework : Roughly two or three textbook sections are **due online 6pm every Friday on Canvas**. The homework will typically cover material covered up to and including the preceding Friday. If students click on a homework assignment in the Assignments tab in Canvas, you will see the the problem set. For every assignment, you are expected to upload a single PDF with the correct page orientation. You can type your homework (using any software you like), or scan the physical copy (using either the scanner or scan applications). If you use electronic pads, that works too. No late homework will be accepted unless accompanied by a doctor's note or other verification of extenuating circumstances. But *the lowest two homework scores will be dropped.*

2. Labs : Every Thursday, lab sections will be held. These lab sections will have smaller class sizes, consisting of working on lab worksheets in groups. This class is supported by Learning Assistants (LAs). LAs are undergraduates who have completed this class (or similar), and who are here to help you learn. Their job is not to offer you answers, but rather to help you figure out how to problem-solve, and how to learn from your classmates. The **worksheets** will typically be due at the end of the lab period. The grade will be based on the quality of the group lab reports and contribution to your group. *The lowest two homework scores will be dropped.*

3. Exams : Four 50-minute exams will be given on select days. All exams will be online, proctored and administered through Canvas. Students must have their webcams (the webcam on a phone is fine) on and directed at themselves during the exams. The exam will be released on Canvas at the beginning of the class. Dates of the exams will be

Feb.5, Mar.3, Apr.2, Apr.27

during class time. A practice exam will be posted a week prior to the midterm that will cover the same material. *Your lowest score of exam will count for 9% of your grade and the rest of three exam scores will each count for 18% of your final grade*

4. Final Group Project : For group project in this course, students will solve given problems with teammates and submit a presentation video. The goal of the project is to apply the technique students have learned in the course to a variety of interesting story problems and to present your process of problem-solving. Each group will solve randomly assigned story-problems and should submit a 2-minutes intro video and 10-15 minutes video presenting your solution. The grades will be calculated using the following:

Intro video (10%) + Final video (70%+bonus) + Peer evaluation (20%)

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.

Letter Grades

Semester letter grades will be converted from the numerical semester scores N as follows:

$93 \leq N \leq 100$	:	A	$73 \leq N < 78$	:	C
$90 \leq N < 93$	:	A-	$70 \leq N < 73$	:	C-
$88 \leq N < 90$	:	B+	$68 \leq N < 70$	:	D+
$83 \leq N < 88$	:	B	$63 \leq N < 68$	:	D
$80 \leq N < 83$	:	B-	$60 \leq N < 63$	:	D-
$78 \leq N < 80$	:	C+	$N < 60$	:	E

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, 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, 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, domain and limit information to determine vertical and horizontal asymptotes. 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 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 students 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.

Disclaimer

This syllabus is not a binding legal contract. I reserve the right to make changes as I see fit at any time, but all adjustments will be announced.

Tentative Pacing Schedule

*** This schedule and topics subject to change ***

Monday	Tuesday	Wednesday	Friday
Jan.18	**Jan.19**	**Jan.20**	**Jan.22**
	Class Start!	1.1 Intro to limit	1.3 Limit theorem
Jan.25	**Jan.26**	**Jan.27**	**Jan.29**
1.5 Limits at infinity	1.5 Infinite limits	1.6 Continuity of functions	2.1 Derivative (slope of curve)
Feb.1	**Feb.2**	**Feb.3**	**Feb.5**
2.2 The Derivative	2.3 Derivative Rules	Review	**Exam1**
Feb.8	**Feb.9**	**Feb.10**	**Feb.12**
0.7 Trig review	1.4 Trig limit	2.4 Trig derivatives 2.5 Chain Rule	2.6 Higher-order derivatives
Feb.15	**Feb.16**	**Feb.17**	**Feb.19**
No class	2.7 Implicit Differentiation	2.8 Related Rate	2.8 Related Rate
Feb.22	**Feb.23**	**Feb.24**	**Feb.26**
2.9 Differentials and Approximations	3.1 Maxima and Minima	3.6 Mean Value Thm 3.2 Monotonicity	3.2 Concavity 3.3 Local min/max
Mar.1	**Mar.2**	**Mar.3**	**Mar.5**
3.5 Graphing functions	Review	**Exam2**	No class
Mar.8	**Mar.9**	**Mar.10**	**Mar.12**
3.4 Practical problems	3.4 Practical problems	3.7 Solving equation numerically	3.8. Antiderivatives
Mar.15	**Mar.16**	**Mar.17**	**Mar.19**
3.9 Differential equation	4.1 Intro to Area	4.1 Intro to Area	4.2 Definite integral (Riemann sum)
Mar.22	**Mar.23**	**Mar.24**	**Mar.26**
4.2 Definite integral	4.3 The first FFT	4.4 The second FFT	4.4 Substitution Rule
Mar.29	**Mar.30**	**Mar.31**	**Apr.2**
4.5 MVT for integral	4.5 Symmetry Periodicity	Review	**Exam3**
Apr.5	**Apr.6**	**Apr.7**	**Apr.9**
No class	5.1 Area of region	5.1 Area of region	5.2 Volume integral: Method of slabs
Apr.12	**Apr.13**	**Apr.14**	**Apr.16**
5.2 Volume integral: Method of disks	5.2 Volume integral: Method of washers	5.3 Volume integral: Method of shells	5.3 Volume integral
Apr.19	**Apr.20**	**Apr.21**	**Apr.23**
5.4 Parametric equation	5.4 Arc length	5.4 Surface area	5.5 Work
Apr.26	**Apr.27**	**Enjoy break ☺**	
Review	**Exam4**		