MATH 1430 : APPLICATIONS OF CALCULUS I

Section 501, CRN 64440

Monday & Wednesday 1:30 - 2:45, Online via Zoom

Fall 2021

Instructor: Ian Burch
E-Mail: ianburch@unm.edu
Office and Hours: Online on Zoom. M/W @ 3:00 - 5:00 pm or by appointment
Division Chair: Elaine Clark, ewclark@unm.edu

Course Description

This course will introduce and explore concepts of calculus, with a particular emphasis on real-world applications. By the end of the course, students should develop a deep understanding of derivatives and their myriad of uses and interpretations, as well as how they are used in applied scenarios. In addition, the basic concepts of integration will be introduced and explored as well.

Course Goals

By the end of the course, students will be able to -

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques
3. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems
4. Use the derivative to describe the rate of change and slope of a curve in general and at particular points. Compare and contrast average rates of change to instantaneous rates of change.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find the antiderivative and indefinite integral functions to include integration by substitution. Apply the Fundamental Theorem of Calculus in computing definite integrals of functions.
7. Approximate the area under the curve using Riemann sums.
8. Use the integral to determine the area under a curve and to find the accumulated value of a function in context.
9. Solve contextual problems by identifying the appropriate type of function given the context, creating a formula based on the information given, applying knowledge of algebra and calculus, and interpreting the results in context.
10. Communicate mathematical information using proper notation and verbal explanations.

Materials:

- Internet Connection & Access to Zoom, Lobomail, and Blackboard Learn
- Scientific calculator (app based is fine)

- Optional: Camera or scanner if submitting handwritten work
- Optional: Lial, Greenwell, & Ritchey, *Calculus with Applications, 10th or 11th Edition*
- Optional: Graphing calculator OR Desmos app

Note that the textbook is **not** required, but is optional. Information will be given through lectures and worksheets, but the book is useful for supplemental examples and additional information.

Late Work:
As we are still dealing with Covid-19 and its effects, I'll be lenient on due dates. Email me if you're going to be late on an assignment and I'll generally give an extension. Late assignments without a valid excuse may be penalized up to 10% per day. Any assignments not submitted by the end of the semester will be automatically graded 0

Grade Breakdown:

Final Exam	20%
2 Midterm Exams	25% (12.5% each)
Homework	35%
Weekly Quizzes	10%
Participation	10%

Letter grades will be given as follows, with + or - given for the highest and lowest 3% in each range, respectively. Incomplete (I) grades will not be assigned without documented, extenuating, circumstances

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
0% - 59%	F

Course Details
Unless otherwise stated, we will have Zoom meetings Monday and Wednesday at 1:30 pm lasting until approximately 2:45 pm. Links will be provided in Learn. Students are expected to be

on time and professional. Please mute if not speaking and use emotes or chat to raise hands or ask questions. The meetings will consist of lectures and lots of examples, with students given time to ask questions and work on homework.

Additional examples will be provided via recorded video. Each week will consist of 1-2 homework assignments and either a short quiz or a discussion on Blackboard Learn. Homework assignments will be graded on if students completed the assignment or not. Most answers will be given so you can check your work, but students are expected to take the initiative and ask whenever their answer disagrees with a given one

Tentative Schedule:
This schedule is subject to change, but all topics listed will be covered during the semester

Date	**Week**	**Topic**	**SLOs**
8/23	**1**	Difference Quotients	1,2,10
8/30	**2**	Limits & Continuity	1,10
9/6	**3**	Derivatives	1,2,3
9/13	**4**	Advanced Derivatives	2,3
9/20	**5**	Review & Test #1	-
9/27	**6**	Critical Points	2,4,5
10/4	**7**	Graphing	2,4,5
10/11	**8**	Economic Applications	2,5,9
10/18	**9**	Other Applications	2,5,9,10
10/25	**10**	Related Rates	3,9,10
11/1	**11**	Review & Test #2	-
11/8	**12**	Optimization	5,9
11/15	**13**	Indefinite Integrals	6,10
11/22	**14**	Definite Integrals	7,8
11/29	**15**	Substitution	6,8
12/6	**16**	Review & Final Exam	-

Expectations:
Students are expected to conduct themselves in a professional and collegial manner. During Zoom meetings, be professional, appropriate, and mute when not speaking. When posting on discussion boards, be polite, concise, and avoid using internet slang. If you need an extension on an assignment, please email or message me before it is due. Students missing more than 4 consecutive assignments may be dropped from the course.

UNM Administrative Mandate on Required Vaccinations
All students, staff, and instructors are required by UNM Administrative Mandate on Required Vaccinations to be fully vaccinated for COVID-19 as soon as possible, but no later than September 30, 2021, and must provide proof of vaccination or of a UNM validated limited exemption or exemption no later than September 30, 2021 to the UNM vaccination verification site. Students seeking medical exemption from the vaccination policy must submit a request to the UNM verification site for review by the UNM Accessibility Resource Center. Students seeking religious exemption from the vaccination policy must submit a request for reasonable accommodation to the UNM verification site for review by the Compliance, Ethics, and Equal Opportunity Office. For further information on the requirement and on limited exemptions and exemptions, see the UNM Administrative Mandate on Required Vaccinations.

UNM Requirement on Masking in Indoor Spaces
All students, staff, and instructors are required to wear face masks in indoor classes, labs, studios and meetings on UNM campuses, see masking requirement. Vaccinated and unvaccinated instructors teaching in classrooms must wear a mask. Students who do not wear a mask indoors on UNM campuses can expect to be asked to leave the classroom and to be dropped from a class if failure to wear a mask occurs more than once in that class. With the exception of the limited cases described above, students and employees who do not wear a mask in classrooms and other indoor public spaces on UNM campuses are subject to disciplinary actions.

Disability Statement:
In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 or arc.unm.edu for additional information.

If you have a documented disability, the Equal Access Services office will provide me with a letter outlining your accommodations. I will then discuss the accommodations with you to determine the best learning environment. If you feel that you need accommodations, but have not documented your disability, please contact Cheryl Dilger, the coordinator for Equal Access Services at 925-8910 or cdilger@unm.edu.

Academic Integrity:
Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Credit-hour Statement:
This is a three credit-hour course. Class meets for two 75-minute sessions of direct instruction for fifteen weeks during the Fall 2020 semester. Students are expected to complete a *minimum* of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

Title IX :
In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered “responsible employees” by the Department of Education (see pg 15 - http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see:
https://policy.unm.edu/university-policies/2000/2740.html

Citizenship and/or Immigration Status: All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related

absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: http://undocumented.unm.edu/.