M161Q-012: Survey of Calculus

Monday, Tuesday, Wednesday, Thursday (7:10pm-8:00pm): Gaines 043; Face-to-Face all class days

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Office Hours: Office hours can be scheduled by appointment at https://www.montana.edu/scheduler/login/student/?fac=31833

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Course Materials:

- **Textbook -** *Applied Calculus For the Managerial, Life, and Social Sciences (*10th edition*)* – S.T. Tan.
- **WebAssign -** (www.webassign.net) Students need to purchase a license for WebAssign to access online course material (including required homework sets). Access is typically included in the purchase price of a new textbook. Students subscribing to Cengage Unlimited will already have access to WebAssign for this course and should not purchase a second license. Online-only access can be purchased through the bookstore or online from the textbook publisher (Cengage). Purchasing access from the bookstore will include a loose-leaf version of the textbook and is the recommended option; other options are the responsibility of the student to ensure access to WebAssign is included. A unique code will be provided to students in the first week of class to enroll in the correct section of WebAssign.
- **Desire2Learn (Brightspace) –** D2L (https://ecat.montana.edu) will be used to post grades and any important news that is specific to our section (room changes, additional practice problems, solutions, course schedule, course homework exercises etc.).
- **Gradescope –** Additional problem sets and exams will be graded and feedback will be provided via Gradescope (www.gradescope.com), which requires no fee.
- **Non-graphing calculator –** permitted for use on exams. Must be a designated calculator; no mobile device calculator apps are permitted.

Course Description:
This course is a survey of basic calculus, with topics including theory and applications of limits, differentiation, and integration. For Spring 2021, this section is a blended learning course with both online and in-person course components. See the Mathematics Department website for updated prerequisites.

Learning Outcomes:
Upon completion of this course, a student will be able to:
- Explain and apply the concept of limit, infinite limits, limits at infinity, asymptotes and how to solve limit problems involving rational and piece-wise defined functions
- Explain the limit definition of the derivative of a function, how it relates to the function itself, and how to use it to compute derivatives in elementary cases
- Explain and apply the power, sum, product, and quotient rules of differentiation
- Explain and apply the derivative of exponential and logarithmic functions
- Explain and apply implicit and logarithmic differentiation
- Graphically analyze functions including how to find local and global extrema, concavity, and inflection points
- Use the derivative to solve related rate and optimization word problems
- Define the definite integral and how to estimate it for linear and quadratic functions
- Explain antiderivatives and the Fundamental Theorem of Calculus
- Use substitution and integration by parts to compute the integrals of polynomials, first-degree rational functions, and exponential functions
- Find the area between the graphs of two functions.

Additionally, upon completion of this Core 2.0 Quantitative Reasoning (Q) course, a student will be able to:
- Interpret and draw inferences from mathematical models such as formulas, graphs, diagrams or tables.
- Represent mathematical information numerically, symbolically and visually.
- Employ quantitative methods in symbolic systems such as, arithmetic, algebra, or geometry to solve problems.

Class Meeting Structure: We will meet face-to-face on Monday, Tuesday, Wednesday, and Thursday of every week in Gaines 043. If we are required to move to a distance learning structure at any point this semester, you will receive a revised syllabus and all students will complete assigned activities in an asynchronous format. In the event of individual quarantine, we will work out an individualized plan for your continued synchronous participation in course assignments, materials, and learning. This plan will mostly likely involve "attending" class via Webex, Microsoft Teams, FaceTime, etc.

Important Class Dates

Wednesday, 2/17, Exam 1	Wednesday, 3/24: Exam 2	Wednesday, 4/28: Exam 3

Grading & Assessment:

- ***10% Homework*** Online homework sets will be completed on WebAssign. The purpose of each assignment is for students to actively engage in learning the methods, techniques, and problem-solving skills in the course. The expectation is that students will complete the homework to learn the material in order to prepare for exams. I strongly recommend that you use a notebook to complete the homework assignments on paper and that you pay attention to communication and correct mathematical notation as you complete the homework assignment.
- ***15% Weekly Problem Sets*** These problem sets will be handed out in class on Mondays, but also posted to D2L. Solutions to these problem sets should be written up carefully and completely in the space provided in the problem set document. Communicating the process by which you arrive at an answer to any given problem is more important to your instructor than the answer, so do your best to show all steps and explain any steps that are not obvious. If the problem explicitly asks for justification or explanation, then you should write it up using complete sentences and appropriate mathematical notation. If there is a box in the space provided, it is for your final answer to the problem. Completed work must be submitted by 11:59pm on Wednesdays. See D2L for more submission details. A scanner or free smartphone app (we recommend Adobe Scan) is required for electronic submission. Your two lowest weekly problem set scores will be dropped *at the end of the semester*. This protocol gives you a bit of a buffer for situations of poor performance, missed submission deadlines, etc.
- ***75% Exams*** There will be three in-class exams throughout the semester. The third exam will be the final exam. Each exam may require comprehensive knowledge of material from the previous exams. **Your best exam will count 30%, next best 25%, and your worst exam will only count 20% of your final course grade.** In order to achieve a grade of C- or better in M161, a grade of at least C- is required on at least one of the exams. Any (non-emergency) conflict with an exam must be discussed with your instructor at least 7 days prior to the exam. This includes university sanctioned reasons for missing exams. The only valid emergency reasons for missing an exam are illness or a family emergency. Most other reasons (employment conflicts, travel plans, etc) are not valid.

I expect that you will approach each assignment seriously, investing the necessary time and energy to prepare your responses. All assignments should be submitted on or before the date they are due. ***Late submissions may not be accepted.*** Most problem set and exam questions will be scored using the following four-point scale. Each assignment will receive a score that reflects the average points-per-question.

4 – Complete	Exhibits comprehensive and thoughtful understanding of content. Completely explained your ideas and math thinking and used correct notation as needed. May contain a trivial error but is organized and complete.
3 – Substantial	Has some details to show you understood the problem. Explains your ideas and math thinking. May contain some errors but is mostly organized.
2 – Developing	Doesn't clearly explain your math thinking or show you understood the problem. May contain significant gaps in understanding or communication. May be incomplete and is unorganized and unclear.
1 – Minimal	Showed no details. Doesn't make sense and has no explanation of ideas of math thinking.
0 – No credit	Is not seriously attempted or insubstantial attempt.

Letter grades will be assigned according to the following table:

A	A-	B+	B	B-	C+	C	C-	D	F
4	3.74	3.64	3.54	3.29	2.99	2.89	2.79	2.69	2.59
3.75	3.65	3.55	3.3	3.0	2.9	2.8	2.7	2.6	0

Additional Resources:

- **Digital Math Learning Center:** The Digital MLC is open for drop in tutoring Monday – Friday from 10am-6pm. Visit the MLC website (http://www.math.montana.edu/undergrad/mlc/) or read through the Digital MLC Guide for Students on D2L to learn how to access this "free" service.

Classroom Decorum & Academic Dishonesty:

- Please exercise common courtesy. No cell phones or ear buds in the classroom.
- Academic dishonesty of any form will not be tolerated and will be punished pursuant to the rules outlined in the Student Code of Conduct (https://www.montana.edu/policy/student_conduct/).
- We believe that collaboration and the appropriate use of mathematical technology can enhance student learning. Just as calculators changed how calculus was taught and learned in the past, resources like Wolfram Alpha, Chegg, Photomath, and other apps and services change how it is taught and learned today. Some assignments

may allow for collaboration between students. However, the direct copying of answers or representation of others' work as your own is considered academic dishonesty.
- Absolutely no collaboration is permitted on exams.
- You may not use any electronic device other than a stand-alone, non-graphing calculator on exams.

Other Information:

Email/D2L Policy. I expect that you will check your D2L every **weekday** for class announcements, new items, etc. I will try to respond to all email communication within 48 hours. Please note that I typically will not check email on weekends.

Americans with Disabilities Act. If you are a student with a disability and wish to use your approved accommodations for this course, please contact me during my office hours to discuss. Please have your Accommodation Notification or Blue Card available for verification of accommodations. Accommodations are approved through the Office of Disability Services located in SUB 174.

Behavioral Expectations. Montana State University expects all students to conduct themselves as honest, responsible and law-abiding members of the academic community and to respect the rights of other students, members of the faculty and staff and the public to use, enjoy and participate in the University programs and facilities. For more information about university conduct guidelines, see the Code of Student Conduct. https://www.montana.edu/policy/student_conduct/

Face Masks. Face coverings are required in all indoor spaces and all enclosed or partially enclosed outdoor spaces. MSU requires all students to wear face masks or cloth face coverings in classrooms, laboratories and other similar spaces where in-person instruction occurs. MSU requires the wearing of masks in physical classrooms to help mitigate the transmission of SARS-CoV-2, which causes COVID-19. The MSU community views the adoption of these practices as a mark of good citizenship and respectful care of fellow classmates, faculty, and staff.

Attendance. Please evaluate your own health status regularly and refrain from attending class and other on-campus events if you are ill. MSU students who miss class due to illness will be given opportunities to access course materials online. You are encouraged to seek appropriate medical attention for treatment of illness. In the event of contagious illness, please do not come to class or to campus to turn in work. Instead notify me by email about your absence as soon as practical, so that accommodations can be made. Please note that documentation (a Doctor's note) for medical excuses is not required. MSU University Health Partners - as part their commitment to maintain patient confidentiality, to encourage more appropriate use of healthcare resources, and to support meaningful dialogue between instructors and students - does not provide such documentation.

Respect for Diversity. It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender identity, sexual orientation, disability, age, socioeconomic status, ethnicity, race, religion, culture, perspective, and other background characteristics. Your suggestions about how to improve the value of diversity in this course are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.
In addition, in scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements**.**
I support an inclusive learning environment where diversity and individual differences are understood, respected, appreciated, and recognized as a source of strength. We expect that students, faculty, administrators and staff at MSU will respect differences and demonstrate diligence in understanding how other peoples' perspectives, behaviors, and worldviews may be different from their own.

MSU Mental Health Resources: MSU strives to create a culture of support and recognizes that our mental health and wellness are equally as important as your physical health. We want you to know that it is OK if you experience difficulty, and there are several resources on campus to help you succeed emotionally, personally, and academically:

- Counseling & Psychological Services: http://www.montana.edu/counseling/
- Health Advancement: http://www.montana.edu/oha/
- Insight Program (Substance Abuse): http://www.montana.edu/oha/insight/
- Suicide Prevention: http://www.montana.edu/suicide-prevention/
- Medical Services: http://www.montana.edu/health/medical.html
- WellTrack: https://montana.welltrack.com/
- Mental Health Screen: https://screening.mentalhealthscreening.org/montanastateuniv