University of Montana

ScholarWorks at University of Montana

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M 171.00: Calculus I

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M 171 Calculus I – Fall Semester 2021

Lecture and Discussion Section Information

Section	Days	Meeting Time	Room	CRN	Instructor
M 171-00	MWF	12:00-12:50	SS 352	73858	Nikolaus Vonessen
M 171-02	TR	10:00-10:50	LA 102	70069	Howard Grotts
M 171-03	TR	11:00-11:50	NAC 103	70240	Christian Lopez Mercado

Instructor Contact Information (Office Hours are posted on Moodle)

Instructor	Office	Email	Phone
Nikolaus Vonessen	Math 207	nikolaus.vonessen@mso.umt.edu	243-6222
Howard Grotts	Corbin 365	howard.grotts@umontana.edu	
Christian Lopez Mercado	Corbin 358	christian.lopezmercado@umontana.edu	

Course Catalog Description

4 Credits. Offered autumn and spring. Prereq., M 122 or M 151 or ALEKS placement ≥ 5 or M03-Maplesoft Calculus score ≥ 15. Differential calculus, including limits, continuous functions, Intermediate Value Theorem, tangents, linear approximation, inverse functions, implicit differentiation, extreme values and the Mean Value Theorem. Integral Calculus including antiderivatives, definite integrals, and the Fundamental Theorem of Calculus.

COVID-19 Issues

- **Mask use is required within the classrooms** (both the main lecture and the discussion sections).
- **Mask use is also required for attending office hours.**
- **If you feel sick and/or are exhibiting COVID-19 symptoms**, please don't come to class and contact the Curry Health Center at (406) 243-4330.
- **UM recommends students get the COVID-19 vaccine.** Please direct your questions or concerns about vaccines to Curry Health Center.
- Class attendance and seating will be recorded to support contact tracing efforts.
- Drinking liquids and eating food is discouraged within the classroom.

Learning Outcomes

The purpose of the courses M 171 and M 172 is to learn the basic concepts in differential and integral calculus. By the end of M 171 students should be able to:

1. Explain the definition of limit, compute it in elementary cases, and determine the limits of transcendental, rational and piecewise defined functions;
2. Compute infinite limits, limits at infinity, asymptotes, and indeterminate forms (the latter using L'Hopital's Rule);
3. Explain the limit definition of continuity;
4. Explain the limit definition of the derivative of a function, and use it to compute derivatives;
5. Use derivatives to find tangent lines to curves and velocity for particle motion;
6. Apply the power, sum, product, quotient and chain rules of differentiation;

7. Compute the derivatives of exponential, logarithmic, and trigonometric functions;
8. Use implicit differentiation;
9. Explain the Intermediate and Mean Value Theorems in concrete settings;
10. Analyze the graph of a function, using continuity and differentiation to determine local and global extrema, concavity, and inflection points;
11. Use the derivative to solve related rate and optimization word problems;
12. Use Newton's Method to estimate the zeros of a function;
13. Use the Fundamental Theorem of Calculus to calculate Riemann integrals, find the area under a given graph and compute the derivative of a function defined by an integral.

General Education Learning Outcome

Upon successful completion of this course, a student will be able to apply effectively mathematical or statistical reasoning to a variety of applied or theoretical problems.

Required Textbook

Calculus (Single Variable), 6th edition, by Hughes-Hallett, Gleason, McCallum, et al. It is available for purchase online at https://www.wiley.com/WileyCDA/Section/id-831905.html. We will cover most of Chapters 1-6.

Calculators

Calculators can be a useful tool for mathematics, making computations less tedious and aiding in exploration of sound mathematical intuition. However, we must be careful. Relying too heavily on calculators can hinder the development of reasoning, estimation, and mental mathematics skills. Plus, it's important to be able to trust your own brain's computational power. Calculators can make mistakes too, and you will never find these mistakes unless you can do enough math in your head to say "That doesn't look right …" For these reasons, **calculators, smartphones and similar devices will NOT be allowed or needed on quizzes and exams**.   In class and on homework we will use calculators or websites like desmos and WolframAlpha for calculations and graphs.

Grading Policy

Item	Percentage of Course Grade
Reading Questions	4%
WeBWorK (online homework)	24%
Quizzes	12%
Three in-class exams (12% each)	36%
Cumulative final exam	24%

Note: You must also pass the Differentiation Skills Test, see below**.

Grade Scale

Cutoff Percentage:	93%	90%	87%	83%	80%	75%	70%	65%	62%	58%	55%
Grade:	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

Course Calendar

Please note that the exam dates are tentative.

Date	Event
September 6	Labor Day – no classes
September 8 (5 pm)	Last day students can add a course on CyberBear
September 20 (5 pm)	Last day students can drop a course on CyberBear or change the grading option to audit
October 1	**Exam 1** (in class)
October 26	**Exam 2** (in class)
November 1 (5 pm)	Last day to add/drop course without Dean's approval (and without WP/WF)
November 11	Veterans Day – no classes
November 24-28	Thanksgiving Break – no classes
November 30	**Exam 3** (in class)
December 10 (5 pm)	Last class day, and last day to petition to drop/add and change to CR/NCR
December 17	The **final exam** is scheduled for **Friday, December 17, 8:00-10:00 am**.

Required Assignments and Exams

Homework

Working hard on the homework is how you will succeed in this class, so, take the homework seriously! It is OK to work together with your classmates on the homework assignments, but you are responsible for fully understanding the problems and their solutions. There will be three components to your homework.

1. **Reading questions**.
   I will expect you to read a section from the textbook almost every day**,** after we've introduced it in class. After reading the section, you will take a quiz on Moodle about the reading. These Reading Quizzes will constitute 4% of your grade, and the lowest 4 scores will be dropped. While grading each question with a score between 0 and 1, the TAs and I will ask ourselves "can I tell from the student's answer that they read the assigned material and made a solid effort to understand it?"
2. **Written Homework from our textbook will be assigned weekly**. While it will not be collected or graded, the weekly Quizzes (see below) will be partially based on the written homework, so **make sure you can do all the problems on the written homework!** Any one of them could show up on the Quiz.
3. **Online homework (WeBWorK).** To access the online homework, visit the math department's [WeBWorK site](https://lennes.math.umt.edu/webwork2) (https://lennes.math.umt.edu/webwork2). From there you will be able to click on our class name (171-Calculus-I_Vonessen_2021F) and then login. Your user ID is your last name (in lowercase), and your initial password is the last 6 numbers of your 790 student ID number. Please change your password right away. Let me know if you have problems logging in. If you registered for the class late I will need to manually enter you into the system.

Quizzes

Weekly, usually on Thursday or Friday. The quizzes take about 10-15 minutes of the class period. **Quiz problems are usually similar to homework problems from our textbook, problems worked during the discussion sections, or WeBWorK problems.** The lowest quiz score will be dropped.

Midterm Exams

There will be three 50-minute in-class exams during the semester. If you have a legitimate schedule conflict with an exam, please let me know as early as possible.

Differentiation Skills Test (DST)

This test will be given for the first time in class sometime in October. The passing score is 80%. You can retake the DST as many times as necessary, but **you must pass the DST by November 15 to earn a passing grade for the course**.

Final Exam

The final exam will be held **Friday, December 17, 2021, 8:00-10:00 am**. By enrolling in this course it is understood that you will be present for the final exam. Your final exam score is worth 24% of your final grade.

Some Strategies to Complete this Course Successfully

- **Check you have the prerequisite**: M 122 or M 151 or ALEKS placement ≥ 5 or M03-Maplesoft Calculus score ≥ 15.
- **Regular attendance is key to success in this class!**
- **Read the textbook both before and after the topics are first covered in class**, and then answer the reading questions on Moodle. It helps to redo examples on your own and then compare your solution with the authors' approach. It may also help you to create your own summary of the material before you start working on the homework and WeBWorK problems.
- **"Do math"**: One of the best ways to learn mathematics is to do mathematics. Each section will have both written homework and online WeBWorK assignments. Expect at least 2 hours of work outside class every day.
- **Get some one-to-one interaction**: take advantage of your instructor's regular office hours (also available by appointment), meet with tutors or with your classmates at the **Math Learning Center** (in the Math building, Room Math 011), create a study group or find a study partner. For some of us this is the most effective (and most fun) way to learn math.
- Log regularly into Moodle for more information.

Course Guidelines and Policies

Classroom and Course-related Behavior

University policy requires that all of us in the classroom treat each other with respect, and refrain from behavior that will disrupt the educational process. Please refrain from using any electronics during class that are not directly related to what we are doing. If you would prefer to be called by a **different name, or gender pronoun**, than listed on the course roster, please let your instructor know.

Student Conduct Code

All students need to be familiar with the [Student Conduct Code](#).   You can find it in the "A to Z" index on the UM home page. In particular, discrimination and harassment are not tolerated at the University of Montana. If you feel that you have been subjected to discriminatory or harassing behavior, please contact the [Office of Equal Opportunity and Title IX](#) at 243-5710 or read [UM's Policy on Discrimination, Harassment, Sexual Misconduct, Stalking, and Retaliation](#) for help in addressing the situation. You can also report the discrimination or harassment to me or to another faculty member or advisor you trust.

Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

Disability Modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

Statement on Digital Access

Digital devices (like laptops and cell phones) are becoming increasingly important to success in college in general, as well as to success in this class. I recognize that some students are unable to afford the cost of purchasing digital devices and that other students rely on older, more problem-prone devices that frequently break down or become unusable. I also recognize that those technology problems can be a significant source of stress for students. Given those challenges, I encourage students to contact me if they experience a technology-related problem that interferes with their work in this course. This will enable me to assist students in accessing support.

Due Dates and Late Work

Extensions for Reading Quizzes and WeBWorK Assignments: If you cannot meet a deadline for a good reason, contact me (if possible before the due date has passed,) and I will usually be able to give you an extension. (If I should receive too many extension requests, I might have to change my policy and only grant extensions in cases of documented illness or other exceptional circumstances beyond your control.)

Except in exceptional circumstances, quizzes and exams must be taken at their scheduled time. I will drop your lowest quiz score, to give you a buffer for unforeseen circumstances. If you know you have a conflict with a quiz or exam, please contact me **early** to see what arrangements can be made.