

Calculus M171 - Fall 2016

MTWF in Math 311 from 9:00A-9:50P

Instructor information

Instructor: Charles Katerba
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Office hours: Tues. 10-11, Wed. 11-12, Fri. 12-1, or by appointment.
WebWork: <http://lennes.math.umt.edu/webwork2/171-Katerba/>

Course overview:

Calculus is the mathematics of changing quantities. It provides a sophisticated tool for understanding our changing world. With an emphasis on applications, this course studies the relationship between a function and its rate of change and introduces derivative and integral calculus.

This class will emphasize the following skills:

1. Problem solving, especially working on problems which you have not already been shown how to solve.
2. Slow and clear rational thinking.
3. Effective mathematical writing, both for communication and as a litmus test for your own understanding.

Textbook:

Single Variable Calculus 6th ed., Hughes-Hallett et. al.

MUS Learning Outcomes:

1. Understand the idea behind the definition of a limit. Use the rules associated to limits to determine the limits of transcendental, rational and piecewise defined functions;
2. Understand the idea behind and the rules of infinite limits, limits at infinity, asymptotes, indeterminate forms and how to use L'Hopital's Rule;
3. Explain the limit definition of continuity;
4. 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;
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. Use the derivatives of exponential, logarithmic, trigonometric and hyperbolic functions;
8. Explain implicit and logarithmic differentiation;
9. Apply the Intermediate and Mean Value Theorems;
10. Graphically analyze functions including 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. Explain Newton's Method for estimating zeros of a functions;
13. Explain the Riemann integral, areas under graphs, antiderivatives and the Fundamental Theorem of Calculus.

Homework:

The time you spend struggling with homework problems is **likely the most important time you will spend on this course**. Please take it seriously and be generous with the time and energy that you put into it.

Weekly homework assignments will be posted on Moodle. Working hard on the homework is how you will succeed in this class, so please, take the homework seriously. You are allowed to work together with your classmates on the homework assignments, but be sure that when you are finished that you understand the relevant concepts on your own. Your homework grade will be split evenly between homework quizzes and online homework.

1. **Written homework.** Each week there will be a written homework assignment from the text. These assignments will not be collected. These problems will be the source of the quiz problems each Tuesday. Each problem is carefully chosen to demonstrate or test an important skill or concept that is required in the study of calculus. Even though they are not collected, I strongly recommend that you do all of the problems assigned each week and keep your completed problems around to help study for exams. Writing complete solutions to the homework problems is the best way to learn. By a complete solution, we mean a solution that a fellow student in class could easily read, understand, and verify. If you have questions about homework write ups, do not hesitate to ask them. Since calculators are not allowed on quizzes I recommend that you try to use your calculator sparingly on the written homework.
2. **WebWork.** Each week there will also be an online homework assignment which will be administered through the WebWork system (see the link above). Your login name is your last name, all lower-case. Your password is currently the last six digits of your UM student ID number. You can and should change your password the first time you log in. Be sure to let me know if you have a problem with the website. WebWork assignments will be due at 11P on the same day as the corresponding written assignment.

Quizzes:

Quizzes in our class come in two distinct flavors:

1. **Homework quizzes.** Quizzes will be given each week on Tuesday to gauge your progress with the material between exams. These quizzes will determine half of your homework grade. Each quiz will be given in class and consists of problems that are directly related to assigned homework problems. No calculators are allowed on quizzes. There will be no makes ups, no retakes and no rescheduling. Your two lowest HW quiz scores will be dropped.

2. **Online quizzes,** which will be posted on Moodle, are to encourage you to prepare appropriately for class. You will have a short, (usually 1 question) multiple choice quiz every Monday, Wednesday, and Friday about the material we will cover that day in class.

Tests:

We will have three 50 minute midterm exams during the semester. They will be on (approximately) Wednesday Sept. 28th, Friday Oct. 28th, and Friday Dec. 2nd. You will also have a 2 hour final exam which will be given on Friday, December 16th, 2015 from 6-8PM in **Urey Hall**. It is your responsibility to take these exams at the scheduled time. All of these tests are closed book exams, however you will be permitted to bring a pre-prepared 3" x 5" note card with handwritten notes on both sides. Calculators will not be allowed on the exams.

Differentiation Skills Test:

This test will be given for the first time immediately after we cover section 3.8, which will be around the middle of October. A score of 80% is required to pass the test. You can take the test as many times as necessary, though you must pass this test by October 28th in order to pass the course. Students who pass the DST the first time it is given will receive a 3% bonus on their final exam.

Grading:

The point distribution for the final course grades will be: 5% prereading quizzes, 12.5% homework, 12.5% homework quizzes, 50% midterm exams, and 20% final exam. Your lowest midterm exam score will be weighted to be half the value of your other two scores (i.e., your lowest midterm exam score will be worth 10% of your final grade and the highest two scores will be worth 20% of your final grade). Letter grades will be assigned as follows:

F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A
0-54	55-57	58-61	62-64	65-69	70-74	75-79	80-82	83-86	87-89	90-92	93-100

Course guidelines and policies:

Politeness

You are expected to be polite to me and your classmates. This includes coming to class on time, acting interested and engaged, and not using electronic devices and computers for social reasons during class.

Calculators

Electronic devices (eg. Calculators) will NOT be permitted or necessary for any tests. On the other hand, you should feel free to use them on your homework.

University Dates and Deadlines

You should be aware of the [important dates and deadlines](#) for Fall 2016 posted by the Registrar's office.

Academic Honesty

I take academic honesty very seriously and I will act on any transgressions that I notice. Misconduct is subject to an academic penalty in this course and/or a disciplinary sanction by the university. We all know that a record of academic misconduct is a very bad thing to have documented in your academic history.

Student Conduct Code

All students should be familiar with the [Student Conduct Code](#).

Disability modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in the Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.