

CLASS TIMES: MTWTh 8:05-9:20am in Room 305, Mathematics Building

INSTRUCTOR: Ian Kit Nicolas (iankit.nicolas@umontana.edu).

OFFICE HOURS: MTWTh 9:30-11:00am or by appointment,
Math Learning Center (MLC), Mathematics Building

PREREQUISITES: Precalculus (M151) or College Trigonometry (M122) or appropriate placement score (ALEKS placement ≥ 5 or M03-Maplesoft Calculus score ≥ 15)

MOODLE PAGE: The Moodle page will frequently be updated with new homework, website links, notes, grades, and any other pertinent files regarding the class. *You should visit the site regularly.* The website is found at:
<https://moodle.umat.edu/course/view.php?id=27175>

TEXT: *Calculus: Single Variable*, 6th edition, by Deborah Hughes-Hallet et al, John Wiley & Sons, 2014 (ISBN 9780470888643).

TOPICS: Differential calculus: limits, continuous functions, Intermediate Value Theorem, tangents, linear approximation, inverse functions, implicit differentiation, extreme values, and the Mean Value Theorem. Integral Calculus: antiderivatives, definite integrals, and the Fundamental Theorem of Calculus.

GRAPHING CALCULATOR: *Strongly recommended.* I will be teaching using a TI-83/TI-84. I will also use Desmos (<https://www.desmos.com>) occasionally in class. Please note that calculators or computers capable of symbolic algebraic computations, like the TI-89 or nSpire, are *not allowed on tests, quizzes, or the final exam.*

LEARNING OUTCOMES:

- 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.
- Understand the idea behind and the rules of infinite limits, limits at infinity, asymptotes, indeterminate forms and how to use L'Hopital's Rule.
- Explain the limit definition of continuity.
- 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.
- Use derivatives to find tangent lines to curves and velocity for particle motion.
- Apply the power, sum, product, quotient and chain rules of differentiation.
- Use the derivatives of exponential, logarithmic, trigonometric and hyperbolic functions.

- Explain implicit and logarithmic differentiation.
- Apply the Intermediate and Mean Value Theorems.
- Graphically analyze functions including using continuity and differentiation to determine local and global extrema, concavity, and inflection points.
- Use the derivative to solve related rate and optimization word problems.
- Explain Newton's Method for estimating zeros of a functions.
- Explain the Riemann integral, areas under graphs, antiderivatives, and the Fundamental Theorem of Calculus.

ALGEBRA SKILLS TEST: There will be an Algebra Skills Test (AST) given in class on **May 16**. This test is given to motivate you to brush up on the prerequisite material you will need to be successful in this class. A score of 80% is required to pass this test and there will be no partial credit given. The AST may be retaken outside of class once a week until **June 27**.

MIDTERMS: There are three Midterm Tests on **June 3**, **June 19**, and **July 9**. Please see the Tentative Schedule for the topics covered in each test. Solutions to the test are posted on the Moodle page after they are taken in class.

FINAL EXAM: There will be a Final Exam on all material covered in the course. This exam is scheduled for **Wednesday, July 31 @ 10-12pm** in the same room as regular class (Room 305, Mathematics Building).

QUIZZES: There will be regular quizzes based on assigned homework and examples worked in class. There will be no make-ups for missed quizzes. *The lowest quiz score will be dropped.* Solutions for the quizzes are posted on the Moodle page after they are taken in class. See the Tentative Schedule for the topics covered in each quiz.

DIFFERENTIATION SKILLS TEST: Each student must pass the Differentiation Skills Test (DST) in order to pass the course. A score of 80% is required to pass this test. This test will be given for the first time in class on **July 11** (this in class DST will be counted as a quiz). The DST may be retaken outside of class and must be passed by **July 25** (the last day of regular classes) in order to pass the course.

HOMEWORK: It is okay to work together with classmates on homework assignments, but you must write up your own solutions in your own words. *Late homework is not accepted.* There will be two components to your homework:

1. *Written homework* is assigned and collected regularly. *Answers alone will not suffice.* It is important to *show your work* and provide *explanations* for your answers. Your work should be *legible*. If I cannot read it, you will get not credit. The purpose of the written homework is to practice writing calculus solutions. Solutions for the written homework will be posted on the Moodle page after class on the dates they are due.

2. *Online homework* is given through WeBWork. Your username is your *last name* (all lowercase); your initial password is the last 6 digits of your student ID. You may change your password by clicking on "User Settings" in WeBWork's Main Menu. The purpose of the online homework is to provide students with instant feedback on calculus concepts. The website is found at:

https://lennes.math.umt.edu/webwork2/171-Calculus-I_Summer

The two lowest *written homework* scores will be dropped. See the Tentative Schedule for the assignment and due dates of the written homework.

ASSESSMENT: 20% Homework (10% Written, 10% WeBWork)
 10% Quizzes
 45% Tests: Algebra Skills Test (6%) and 3 Midterms (13% each)
 25% Final Exam
 Passing score (80%) on Differentiation Skills Test needed to pass the course

GRADING SCALE:

≥ 93%	90%	87%	83%	80%	75%	70%	65%	62%	58%	55%	< 55%
A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

SOME IMPORTANT DATES:

May 13	First day of class
May 16	Algebra Skills Test (in class)
June 3	Midterm Test 1
May 27	No class (Memorial Day)
June 19	Midterm Test 2
June 29-July 7	No classes (4th of July Break)
July 9	Midterm Test 3
July 11	Differentiation Skills Test (in class)
July 25	Last day of class
July 31	Final Exam (10-12pm)

Please see the Registrar's website (<http://www.umt.edu/summer-semester>) for a complete list of Summer Session 2019 dates and deadlines. Also, please see the Tentative Schedule for dates and deadlines in the class.

MAKE-UP POLICY: Make-ups for tests will *only* be given under special and extenuating circumstances such as a family emergency or illness provided official documentation is furnished by the student. It is your responsibility to notify the instructor as soon as you are aware that you will miss a test in order for a make-up to be possible. Early final exams will *not* be given.

ADVICE FOR STUDENTS:

- Read through the material to be covered in the lecture before coming to class. This will be helpful for taking notes in class and you will get more out of the lecture. The course will move rapidly. Daily reading in the textbook *with paper and pencil in hand to verify the calculations* and doing all assigned problems will go a long way towards success in this course. You should plan to spend 2 hours outside of class for each hour in class (and *more* if you have missed a class).
- Do *not* equate understanding what the instructor does in class with being able to work (or solve) a problem yourself. When a problem or concept is explained in class you may understand this, but that does *not* imply that you can do a similar problem. You must attempt to work out the homework problems from beginning to end. The best way to learn mathematics is to do, to ask, and to do again.
- Before starting your homework go over the concepts and examples from class and from the textbook. Memorize the formulas, algorithms, definitions, notations, etc. Then work through a few problems which have answers in the back of the book. Attempt to do the rest of your homework without using the book or your class notes.

ACADEMIC MISCONDUCT: 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. All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umt.edu/student-affairs/dean-of-students/default.php>.

ACCOMMODATION: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and Disability Services for Students (DSS). If you think that you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lom-massen 154. I will work with you and DSS to provide an appropriate accommodation.