MTH 132 — Calculus I

Spring 2020

Instructor Information

Instructor:	Ben Salisbury, Associate Professor
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Office:	Pearce 211
Office Hours:	Tuesdays 10-11:50am and 2-2:50pm, and by appointment

Course Information

Meeting Times:	MW 10-11:50am in Moore Hall 120
Course Text:	*Essential Calculus: Early Transcendentals*, second ed., by J. Stewart

Description: Limits, continuity, interpretations of the derivative, differentiation of elementary functions, applications of derivatives, antiderivatives, Riemann sums, definite integrals, fundamental theorem of calculus. In particular, we will cover most of Chapters 1 through 5 of the course text.

Expectations: You are expected to work *very, very hard!* Mathematics is a challenging subject which is best learned through practice, practice, and more practice. You are expected to read the material to be covered in class *ahead of time* so you will be better equipped to ask and answer questions during the lecture. My lectures should serve as a guide and additional explanation, as well as a venue to ask questions and receive evaluation, as *you* learn the material. Additionally, homework exercises and practice, which are addressed below, may be even more beneficial if attempted after the first reading of the corresponding section but before the class in which they are covered. This way you have an opportunity to think about the problems ahead of time and form any coherent and well-thought-out questions to be asked during class. In my experience, one of the aspects that students struggle with most, in general, is how to form the question to which they need answering.

Suggestion: Given the difficulty of the topics being presented throughout this semester, I cannot stress how important it is not to let yourself fall behind. If at any point you feel that you are not understanding the material as well as you should, then you need to formulate thoughtful questions to be asked during class that address your difficulties or, perhaps better, visit me during office hours or schedule an appointment to discuss the matter directly. You are urged to take advantage of office hours as often as you need!!

Course Outline

Week	Section	Title
1	1.1	Functions and Their Representations
	1.2	A Catalog of Essential Functions
	1.3	The Limit of a Function
	1.4	Calculating Limits
2	1.5	Continuity
	1.6	Limits Involving Infinity
3	2.1	Derivatives and Rates of Change
	2.2	The Derivative as a Function
	2.3	Basic Differentiation Rules
4	2.4	The Product and Quotient Rules
	2.5	The Chain Rule
	2.6	Implicit Differentiation
5	Review and **Exam 1**	
6	2.7	Related Rates
	2.8	Linear Approximation and Differentials
7	3.1	Exponential Functions
	3.2	Inverse Functions and Logarithms
	3.3	Derivatives of Logarithmic and Exponential Functions
8	3.4	Exponential Growth and Decay
	3.5	Inverse Trigonometric Functions
	3.7	Indeterminate Forms and L'Hospital's Rule
9	4.1	Maximum and Minimum Values
	4.2	The Mean Value Theorem
10	Review and **Exam 2**	
11	4.3	Derivatives and the Shapes of Graphs
	4.5	Optimization Problems
	4.6	Newton's Method
12	4.7	Antiderivatives
	5.1	Areas and Distances
13	5.2	The Definite Integral
	5.3	Evaluating Definite Intgrals
14	5.4	The Fundamental Theorem of Calculus
	5.5	The Substitution Rule
15	Review and **Exam 3**	

Homework, Quizzes, and Exams

Homework. Homework will be completed online through WeBWork. There will be a handful of questions based on the questions given in the course text.

Quizzes. There will be a quiz on the Thursday of each week (except for the weeks in which there is an exam). The quizzes will have two questions, and both questions will be taken exactly from the homework questions already completed.

Exams. Exams will reflect the material covered in class and practiced on the homework and quizzes. Moreover, there will be a number of questions that will be taken verbatim from the quizzes. Additionally, on each exam, there will be a number of questions taken directly from examples worked out in class. The remaining questions will be new questions, but relevant to the sections covered for exam. For example, on an exam of 10 questions, 3 may be taken directly from the quizzes, 2 may be taken directly from worked examples in class, and the remaining 5 questions will be new questions.

Grading Breakdown

Category	**Frequency**	**Percentage**
Homework	Weekly	10%
Quizzes	Weekly	10%
Exam 1	Wednesday, February 12, 2020	20%
Exam 2	Wednesday, March 25, 2020	20%
Exam 3	Monday, April 27, 2020	20%
Final Exam	Monday, May 4, 2020, 10–11:50am	20%

Important: There are no make-ups for quizzes nor exams. In the event of an extreme emergency, an exception to this policy may be made. However, this exception is at the discretion of the instructor.

Additional Notes

- No attendance will be taken in class *but* you are responsible for knowing the material, assignments, and anything else presented and announced in class. While attendance in class is (theoretically) optional, be advised that your grade will most assuredly suffer from repeated absence from the lectures.
- Calculators are allowed, and your particular choice of calculator brand and model is up to you. However, be aware that all work must be shown on homework, quizzes, and exams in order to receive full credit. Please also know that I am aware that there exist calculators in which entire collections of notes may be stored and retrieved upon command, which may not be used on quizzes nor exams. Moreover, you may not use an app on a cell phone, iPod, or any device which transmits or takes photographs. Violation of this calculator policy is a violation of the CMU Academic Integrity policy and will be dealt with accordingly.
- The *Mathematics Assistance Center* offers students free tutoring for our course. They are located in Park Library, Room 370 and in Troutman Hall, Room 002. For more information, please call (989) 774-2290, email MathAC@cmich.edu, or go to

https://www.cmich.edu/colleges/se/math/Mathematics%20Assistance%20Center/Pages/default.aspx.

- Blackboard use will be essential in this course. If you have a technical issue related to Blackboard, please contact the OIT Help Desk at (989) 774-3662, helpdesk@cmich.edu, or http://helpdesk.cmich.edu.
- There are resources on our course webpage that will help you understand and visualize topics in class. You are encouraged to use these resources throughout the semester and to continue to check for updates, as more resources may be added as the semester progresses.
- The last day to drop the class with a refund is Friday, January 17, 2020. The final day to withdraw from a sixteen-week course with an automatic "W" is Friday, March 27, 2020. You can find more details at

  https://www.cmich.edu/ess/registrar/RegistrarCalendars/Pages/DropWithdrawalDeadlines.aspx.

- CMU provides students with disabilities reasonable accommodation to participate in educational programs, activities, or services. Students with disabilities requiring accommodation to participate in class activities or meet course requirements should first register with the office of Student Disability Services (120 Park Library, telephone: 989-774-3018, TDD 989-774-2568), and then contact me as soon as possible. Their website is

  https://www.cmich.edu/ess/studentaffairs/SDS/Pages/default.aspx.