Math 233 — Calculus III

Fall 2018

Instructor Information

Instructor:	Ben Salisbury, Associate Professor
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Office:	Pearce 206H
Office Hours:	Tuesdays 3-3:50pm, Wednesdays 12-1:45pm, and by appointment

Course Information

Meeting Times:	MTWR 11-11:50am in Pearce 226
Course Text:	*Essential Calculus: Early Transcendentals*, second ed., by J. Stewart

Description: Techniques of integration, applications of definite integrals, improper integrals, elementary differential equations, infinite series, Taylor series, and polar coordinates. In particular, we will cover most of Chapters 10 through 13 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	10.1	Three-Dimensional Coordinate Systems
	10.2	Vectors
2	10.3	The Dot Product
	10.4	The Cross Product
3	10.5	Equations of Lines and Planes
	10.6	Cylinders and Quadric Surfaces
	10.7	Vector Functions and Spaces Curves
4	10.8	Arc Length and Curvature
	10.9	Motion in Space: Velocity and Acceleration
	11.1	Functions of Several Variables
5	Review and **Exam 1**	
6	11.2	Limits and Continuity
	11.3	Partial Derivatives
	11.4	Tangent Planes and Linear Approximation
	11.5	The Chain Rule
7	11.6	Directional Derivatives and the Gradient Vector
	11.7	Maximum and Minimum Values
	11.8	Lagrange Multipliers
8	12.1	Double Integrals over Rectangles
	12.2	Double Integrals over General Region
9	12.3	Double Integrals in Polar Coordinates
	12.4	Applications of Double Integrals
	12.5	Triple Integrals
10	Review and **Exam 2**	
11	12.6	Triple Integrals in Cylindrical Coordinates
	12.7	Triple Integrals in Spherical Coordinates
	12.8	Change of Variables in Multiple Integrals
12	13.1	Vector Fields
	13.2	Line Integrals
	13.3	The Fundamental Theorem for Line Integrals
13	13.4	Green's Theorem
	13.5	Curl and Divergence
	13.6	Parametric Surfaces and Their Areas
14	13.7	Surface Integrals
	13.8	Stokes' Theorem
	13.9	The Divergence Theorem
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

Homework	Weekly	10%
Quizzes	Weekly	10%
Exam 1	Thursday, September 27	20%
Exam 2	Thursday, November 1	20%
Exam 3	Tuesday, December 4	20%
Final Exam	Friday, December 14, 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/cst/math/pages/mathematics-assistance-center.aspx.

- Blackboard will be incorporated to some extent in this course. If you have an 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, August 31. The final day to withdraw from a sixteen week course with an automatic "W" is Friday, November 2. You can find a more detailed semester calendar at

  https://www.cmich.edu/ess/registrar/RegistrarCalendars/Pages/default.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.