MTH 235 CALCULUS I (4 credits)
SYLLABUS

Communicating With the Instructor

When questions arise throughout the course, please remember to check the following resources for an answer **before** reaching out to me:

1. Course Syllabus
2. Announcements
3. The Question Center discussion board

Question Center Discussion

The Question Center Discussion is a great place for you to ask questions and get answers from your peers and from me. You are encouraged to post your questions here before reaching out directly to me unless it is a time-sensitive matter. If you have questions of a personal nature such as relating to a personal emergency, questioning a grade on an assignment, or something else that needs to be communicated privately, you are welcome to contact me directly via email or phone.

Response Time

If you need to contact me directly, my preference is that you will email me. Please allow 24 hours for me to respond to emails Monday through Friday and 48 hours on the weekend.
If you have a question about the technology being used in the course, please contact the Doane University Service Center for assistance, their contact information is listed later in the syllabus.

Technology Help

If you have a question about the technology being used in the course, please contact the Doane University Service Center for assistance, their contact information is listed later in the syllabus. If there are third-party tools utilized in the course, please reach out to them directly.

Catalog Description

An examination of the fundamentals of limits and differentiation, and an introduction to integration. Students successfully completing this course will be able to: 1) conceptually understand the definitions of limit, derivative and integral, 2) apply the concepts of limits and differentiation to a variety of theoretical and real-life questions and 3) decisively utilize paper/pencil and technology-based problem-solving techniques.

Course Textbook and Materials

Required

Single Variable Calculus with Early Tranceendentals (Access+ebook)

Authors: Paul Sisson and Tibor Szarvas

Publisher: Hawkes Learning Systems

ISBN-13: 9781946158253

ISBN-10: 1946158259

*Course books and materials will be integrated into your Canvas portal

Learning Objectives and Course Outline

Mathematics Program Objectives

In this course students will learn to

- Demonstrate persistence while working on problems that they find difficult. ● Communicate mathematical arguments and results clearly by choosing the appropriate representation for the intended audience and purpose.
- Use appropriate technology to enhance their mathematical thinking and understanding. ● Demonstrate the ability to think logically and critically while solving mathematical problems.

Course Objectives

1. By the end of the course, you will be able to:
2. Demonstrate a conceptual understanding of limits, derivatives, and integrals.
3. Compute limits graphically, numerically, and algebraically.
4. Determine derivatives graphically, numerically, and algebraically.
5. Demonstrate persistence by modeling and solving real-world problems using derivatives and integrals.
6. Determine integrals graphically, numerically, and algebraically.
7. Communicate a clear understanding of conclusions by presenting solutions in the correct form and interpreting the result.

Undergraduate Core Outcomes

This course intentionally addresses the learning outcomes common to all courses fulfilling the *Mathematical Reasoning* Foundational Area of Knowledge. Students will learn basic strategies of mathematical thought in order to analyze complex scenarios, make connections, solve problems, explain conclusions, and think more effectively. Specifically, throughout this course, students will work to:

- Communicate a clear understanding of conclusions
- Apply mathematical systems of thinking

They are assessed through homework and exams. Both outcomes will be formally assessed on the final exam.

Module	Topic	Assessments & Activities Objectives
1	Precalculus Review	**Assignments:** Self-Introduction Discussion Precalculus Review HW Section 1.1 HW Section 1.2 HW Section 1.3 HW **Assessments:** Quiz 1 ● Apply the properties of exponents to simplify expressions. ● Apply properties of logarithms to simplify expressions. ● Factor polynomials. ● Understand piecewise functions. ● Find the domain, range, intercepts, and other basic information about a function and its graph. ● Use function operations to combine two or more functions. ● Apply function transformations to the graph or expression of a function.
2	Limits	**Assignments:** Section 2.1 HW Section 2.2 HW Section 2.4 HW Section 2.5 HW ● Compute average velocity in order to determine instantaneous velocity. ● Compute difference quotients in order to

Module	Topic	Assessments & Activities Objectives

		Assessments: Quiz 2	determine the slope of the tangent line to a curve at a point. ● Evaluate one-sided limits and limits at infinity. ● Evaluate limits using graphs, tables, limit laws, and algebraic manipulation. ● Determine if a function is continuous at a point. ● Identify if a function has a removable or non-removable discontinuity.
3	Derivatives	**Assignments:** Section 2.6 HW Section 3.1 HW Section 3.2 PART A HW Section 3.2 PART B HW **Assessments:** Quiz 3	● Express the derivative of a function as a limit. ● Evaluate this limit of the difference quotient algebraically. ● Use formulas to take derivatives of polynomial, radical, and exponential, functions. ● Relate the first derivative to velocity and the second derivative to acceleration. ● Use the product and quotient rules to take derivatives.
4	Derivatives, Cont.	**Assignments:** Section 3.3 HW Section 3.4 HW Section 3.5 HW Section 3.6 HW	● Find the derivatives of trigonometric functions. ● Apply the chain rule to find derivatives of composite

		Assessments: MidTerm Exam	functions. ● Find the derivative of an implicitly defined function. ● Find the derivative of logarithmic functions.
5	Application of Derivatives	**Assignments:** Section 3.8 HW Section 3.9 HW Section 4.1 HW **Assessments:** Quiz 4	● Construct and solve a related rate equations. ● Construct the linear approximation of a function at a point. ● Calculate differentials. ● Use linear approximation and differentials to find error and approximate values.

Module	**Topic**	**Assessments & Activities Objectives**
		● Find critical numbers and critical points. ● Find absolute extrema on a closed interval.

6	Application of Derivatives, Cont.	**Assignments:** Section 4.3 PART A HW Section 4.3 PART B HW Section 4.4 HW Section 4.6 HW **Assessments:** Quiz 5	● Find intervals where a function is increasing and decreasing. ● Find relative extrema using the first derivative test. ● Find intervals where a function is concave up or concave down. ● Find inflection points. ● Use the second derivative test to find relative extrema. ● Evaluate limits using L'Hopital's rule. ● Solve applied problems involving maximizing or minimizing a function (optimization).
7	Integration	**Assignments:** Section 4.7 HW Section 5.1 HW Section 5.2 HW **Assessments:** Quiz 6	● Calculate general antiderivatives of basic polynomial, trigonometric, and exponential functions. ● Estimate the area under a curve using left and right Riemann Sums. ● Understand how to use sigma notation and summation formulas. ● Use the limit process to find the area under a curve. ● Understand the relationship between definite integrals and area under the curve. ● Evaluate definite integrals

		using geometric equations and integral properties.
8	Integration, Cont.	**Assignments:** Section 5.3 HW Section 5.4 HW Section 5.5 HW **Assessments:** Final Exam ● Apply the Fundamental Theorem of Calculus to solve problems involving integrals. ● Evaluate indefinite integrals using antiderivatives of polynomials, exponential

Module	**Topic**	**Assessments & Activities Objectives**
		functions, and trigonometric functions. ● Use u-subsitution to solve definite and indefinite integrals. ● Use integrals to find the area between two curves.

Course Requirements

This is an online course and there will **not be any face-to-face class sessions**. All communications, submissions of assignments, course interactions, and posting of grades will utilize Canvas LMS (https://doane.instructure.com). You must have a **reliable internet connection** throughout the duration of the course.

Calculators

A basic scientific calculator is needed for exams. **Graphing calculators or calculators on a cell phone are not permitted for** exams or quizzes.

Attendance/Participation

Attendance in an online course means logging into Canvas regularly and participating in all of the

activities that are posted in the course. In addition, check your Doane University email account regularly, as I may send important information about the course.

Class Preparation

Preparation for class means reading the assigned readings and reviewing all information required for that module. You should plan to work on this course everyday. This is a condensed, fast-paced, course. Expect to spend approximately 20 hours a week preparing for and actively participating in this 8-week course. Regular engagement is expected for online courses.

Netiquette Guidelines

At heart, Netiquette (etiquette for the Internet) is simple, good manners and business courtesy. Some of it may seem basic, but some infringements can result in major problems for others or can create an unintended insult to another user. The guidelines are adapted from The Core Rules of Netiquette by Virginia Shea (1994). For more information, please review the Netiquette Guidelines in the Student Resource Center.

Computer Requirements

For the successful use of Canvas please refer to Doane University's minimum computer requirements. This also includes:

- Reliable computer and internet connection
- A web browser (Chrome or Mozilla Firefox)
- Adobe Acrobat Reader (free)
- Word processing software—Microsoft Word or Google Docs
- Webcam and mic*

*For privacy purposes, use of a webcam is **optional** during video conferencing and recording.

Campus Network or Canvas Outage

When access to Canvas is not available for an extended period of time (greater than one entire evening - 6 pm until 11 pm) you can reasonably expect that the due date for assignments will be changed to the next day.

Drop and Add Dates

If you feel it is necessary to withdraw from the course, please contact your advisor for full details on the types of withdrawals that are available and their procedures.

Federal requirements state that students must complete 75% of the coursework to be eligible to receive an incomplete for the course. If students fall more than two weeks behind, they cannot meet this requirement.

Academic Integrity

Fundamental to our mission, our core values, and our reputation, Doane University adheres to high academic standards. Students of Doane University are expected to conduct themselves in a manner reflecting personal and professional integrity. Disciplinary actions may be taken against students whose

academic behavior is not congruent with the expectations of the University. Students are responsible for adhering to the standards detailed in this policy. Not being familiar with these standards does not mean that the students will not be accountable for adherence to them. Additional details on the Academic Integrity policy for violating academic integrity are published in the undergraduate and graduate catalogs. Please review Doane University's Academic Integrity Policy.

Course Grading

Submitting Assignments

All assignments, unless otherwise communicated to me, must be submitted via Canvas. Each assignment will have a designated place to submit your work. All materials, assignments, and deadlines are subject to change without prior notice. It is your responsibility to stay in touch with me and review the course site, including Announcements, regularly to learn about changes to assignments or due dates. **All assignments and due dates are reflective of Central Standard Time**.

Grading Scale

Assignment of letter grades is based on a percentage of points earned. The letter grade will correspond with the following percentages achieved. All course requirements must be completed before a grade is assigned.

- A+ 97-100
- A 93-96
- A- 90-92
- B+ 87-89
- B 83-86
- B- 80-82
- C+ 77-79
- C 73-76
- C- 70-72
- D+ 67-69
- D 63-66
- D- 60-62
- F <60

Grading Scheme

The following outlines the weighted breakdown for how grades will be calculated:

Homework (Certify) – 20%

Quizzes – 30%

MidTerm Exam – 25%

Final Exam – 25%

Homework

In order to master mathematical skills, extensive practice is necessary. Therefore, students will be expected to complete homework problems related to each topic covered. You have infinite attempts at the

homework. The homework will come from the Certify section. As long as you master the lesson by the due date, you will receive a 100% on the homework. There will be penalties for mastering the assignment late.

Quizzes

Quizzes will be taken at the end of Modules 1, 2, 3, 5, 6, and 7. They will cover the material from the sections covered that week. You will have one hour to take the quiz. You must write down all of your work neatly on a sheet of paper and upload it as the last question on the quiz. You may get partial credit from your work or lose points if you do not use the correct method being assessed.

Exams

There will be two exams. A Midterm and a Final. You will have 2 hours to complete the exam. You must write down all of your work neatly on a sheet of paper and upload it as the last question on the Exam. You may get partial credit from your work or lose points if you do not use the correct method being assessed.

Late or Missed Assignments

Since Calculus is a subject that builds on previous material, you must complete the course in order. If you fall behind, you need to let me know as soon as possible, so we can make a plan to get you back on track to finish the course successfully.

There is a penalty for mastering Certify late. If you do not master a lession by the end of the course, you will receive a zero.

Quizzes and Exams are always due Sunday at 11:59 pm. You **CANNOT** make up a quiz or exam unless you contact me **BEFORE** the quiz/exam is due.

Assignment & Assessment Feedback

Please allow 1-3 days for feedback on assignments. Be sure to review all of my feedback, as this will help you reflect on what you have learned while receiving suggestions for improvement.

Grade Appeals

Students who believe that their grade was miscalculated due to a mathematical error should contact the instructor within **ten (10) days of the grade posting**. A student is encouraged to talk with their advisor to offer an assessment of the concern and to clarify the steps of the appeal process. More information is published in the Undergraduate and Graduate Catalogs.

Studying and Preparation Time

The course requires you to spend time preparing and completing assignments. A four-credit course requires 144 hours of student work. Therefore expect to spend approximately 18 hours a week preparing

for and actively participating in this 8-week course.

Tutor Me
Students will have access to a free tutor me service within their Canvas account. You can connect with a live free tutor or submit a paper to get feedback before submitting.

Submitting Assignments
All assignments, unless otherwise announced by the instructor, MUST be submitted via Canvas. Each assignment will have a designated place to submit the assignment. Support and Services

Technical Support

If you are in need of technical assistance, please access the Self-Service Portal. You may reach the help desk at 402-826-8411 or by email at helpdesk@doane.edu.

Accessibility Statement

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990, professional disability specialists and support staff at Doane University facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities. Doane University staff coordinate student transitions from high schools and community colleges, conduct in-service training for faculty and staff, enable the resolution of accessibility issues, conduct community outreach, and facilitate collaboration among Doane University staff on disability policies, procedures, and accommodations.

Accommodations & Disability Services

Doane University's Disability Services Office will provide guidance on accommodations and universal access. To request accommodations please complete the Self-Identification Form and visit the website for additional information as soon as possible.

Academic Support

Doane University offers all of its students access to Academic Support services.

Title IX Requirements: Mandatory Reporting

At Doane, all university employees, including faculty, are considered Mandatory Reporters. As a Mandatory Reporter, I am required to report incidents of sexual misconduct and relationship violence to the Title IX Coordinator and, thus, cannot guarantee confidentiality. This means that if you tell me about an incident of sexual harassment, sexual assault, domestic violence, dating violence, stalking and/or other forms of prohibited discrimination, I have to share the information with the University's Title IX Coordinator. My report does not mean that you are officially reporting the incident. This process is in place to ensure you have access to and are able to receive the support and resources you need. For additional information, including confidential resources, please visit the Campus Advocacy, Prevention, and Education (CAPE) Project.

Anti-Harassment Policy

Doane University, referred to as the "University", is committed to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community. This policy addresses the University's responsibilities under Title IX, the Violence Against Women Reauthorization Act of 2013, and the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act ("Clery Act"). More information is published in the Student Handbooks.

Instructional Technology Accessibility and Privacy Policies

Technology accessibility and privacy policies are available on the Student Resource Center within the Canvas LMS.

Syllabus Disclaimer

I (the instructor) view the course syllabus as an educational contract between myself and each student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. I reserve the right to make changes to the syllabus as deemed necessary. Students will be notified in a timely manner of any syllabus changes via email or in the course site Announcements. Please remember to check your Doane University email and the course site Announcements often.

Syllabus Changes

The instructor and Doane University reserve the right to make changes as necessary to this course syllabus. All students will be notified of any changes.

Syllabus Addendum

Each student is responsible for being aware of the policies, resources, and expectations as specified in the Doane Syllabus Addendum.