Course Information

Course Number:	Math 1496
Course Name:	Calculus I
CRN:	21872
Location:	MCS 105
Class Hours:	12:00pm-12:50pm MWF; 12:15-1:30pm TTh
Textbook:	Required: Calculus (Early Transcendentals 2nd ed.) by Brings, Cochran, and Gillett Optional/Supplemental: Calculus for Cats by Amdahl and Loats.
Prerequisites:	C or better in MATH 1390 and C or better in MATH 1392 OR C or better in MATH 1580

Instructor Information

Name:	Dr. Jeffrey Beyerl
Office Location:	MCS 237
E-mail:	jbeyerl@uca.edu
Phone:	501-450-5652

Office Hours:

Monday	10:00am
Tuesday	10:00am
Wednesday	10:00am*
Thursday	10:00am

*The office hours on Wednesday are in the MRC

Question: Can I only come during office hours?
Answer: You can come anytime! I am typically in my office from 8am until 4pm; office hours are merely designated times that I avoid scheduling meetings or running errands.

Learning Assistant Office Hours (MCS 110):

Monday	3:00-4:00pm
Tuesday	6:30-8:30pm*
Wednesday	3:00-4:00pm

*The Wednesday office hours are virtual office hours using Skype (Screen Name = csharpe90)

Course Description

This course is required of all majors or minors in mathematics, chemistry, or physics. Topics include applications of the definite integral, techniques of integration, infinite series, conics, parametric equations, polar coordinates, vectors, and vector functions. This course is a prerequisite for Calculus III and most of the upper division mathematics courses.

Course Objectives and Requirements

The primary objective in this course is to develop the theory and computational skills for the three main topics in calculus:

- Limits
- Derivatives
- Integrals

Grading Policy

- Your grade will be computed from tests, quizzes, oral problem presentations, homework, and a comprehensive final exam.
- Make-up tests/quizzes will only be given for official university events or personal emergencies. In the former case the test must be taken before official test date, in the latter case a short letter explaining why you missed the test, why this justifies a make-up, and supporting documentation must be turned in before the day you're able to return to class. In the event that a make-up is justified, it must be taken before you are able to return to class. At his discretion, the instructor may choose to administer a make-up test or use the final exam to replace the make-up.
- Borderline grades will be determined based on the final exam and effective participation throughout the course.
- Oral problem presentations are in Dr. Beyerl's office. Each student will sign up for a time to meet with the instructor. There will be one problem presentation every three weeks, approximately.
- Homework problems will be assigned on a weekly basis and are due every Monday. It is assumed that students with a good attendance record are keeping up with the homework and thus automatically receive full marks and need not turn it in unless you have a specific question.

Test 1	15%
Test 2	15%
Test 3	15%
Quizzes	10%
Oral Problem Presentations	10%
Homework	10%
Final Exam	25%

Student Learning Objectives

Upon successful completion of this course, the student will be able to:

- Explain the concept of and evaluate limits graphically, numerically, and algebraically.
- Recognize continuous and discontinuous functions.
- Understand the formal definition of derivative as a difference quotient and what this means, graphically, numerically, and as a rate of change.
- Identify when a function is or is not differentiable.
- Evaluate derivative using basic rules: power, sum, product, quotient, chain rules, and implicit differentiation.
- Solve basic application problems using derivatives
    - Function behavior: increasing, decreasing, maximums, minimums, concavity, inflection points
    - Optimization
    - Related rates
- Explain the formal definition of definite integral as a limit of Riemann sums and what this means graphically, numerically, and as a multiplicative sum.
- Evaluate antiderivatives, integrals, and definite integrals using basic rules and u-substitution.
- Use definite integral to find the area of a region and volume of a solid of revolution.

Algebra Review

Algebra is the mathematical foundation on which calculus is built. We cannot do calculus without doing even more algebra. In fact, it is said that most students that fail calculus do so because of the algebra, not the calculus. As such, we're going to review algebra on a daily basis. At the end of every class, 5 students will be given an algebra review problem to solve on the board at the start of the next class. Each day we'll start off class by discussing the day's algebra problem.

Tentative Course Outline

Chapter 1	Functions • Review of Functions • Representing Functions • Inverse, Exponential, and Logarithmic Functions • Trigonometric Functions and Their Inverses
Chapter 2	Limits • The Idea of Limits • Definitions of Limits • Techniques for Computing Limits • Infinite Limits • Limits at Infinity • Continuity • Precise Definitions of Limits
Chapter 3	Derivatives • Introducing the Derivative • Working with Derivatives • Rules for Differentiation • The Product and Quotient Rules • Derivatives of Trigonometric Functions • Derivatives as Rates of Change • The Chain Rule • Implicit Differentiation • Derivatives of Logarithmic and Exponential Functions • Derivatives of Inverse Trigonometric Functions • Related Rates
Chapter 4	Applications of the derivative • Maxima and Minima • What Derivatives Tell Us • Graphing Functions • Optimization Problems • Linear Approximation and Differentials • Mean Value Theorem • L'Hospital's Rule • Newton's Method • Antiderivatives
Chapter 5	Integration • Approximating Areas under Curves • Definite Integrals • Fundamental Theorem of Calculus • Working with Integrals • Substitution Rule
Chapter 6	Applications of integration • Velocity and Net Change • Regions Between Curves • Volume by Slicing • Volume by Shells • Length of Curves • Surface Area • Physical Applications (Maybe) • Logarithmic and Exponential Functions Revisited (Maybe) • Exponential Models (Maybe) • Hyperbolic Functions (Maybe) • Definitions of Limits (Maybe)
Chapter 7	Integration techniques (We may or may not get to this section)

Important Dates

Last day to Drop Drop means the course is not on your record	August 24th
Test 1	September 22nd
Test 2	October 27th
Last day to Withdraw Withdraw means the course is on your record with a "W" but does not factor into your GPA	October 28th
Last day for WF/WP WF means withdraw failing and is factored into your GPA as an "F" WP means withdraw passing and is not factored into your GPA WF/WP will be decided by whether or not your current grade is above or below 60%. Please see me to verify your grade before withdrawing with a WF/WP.	November 28th
Test 3	November 29th
Final Exam	Tuesday, December 6th 11am-1pm

Outside of class resources

- The Textbook
  - Description of material
  - Example problems
  - Exercise problems
  - Homework problems
- Blackboard
  - Quiz/test solutions
  - Notes from class
- Office Hours
  - Individual help
- LA Sessions
  - Meet with the learning assistant
  - Virtual Office Hours
- The Math Resource Lab
  - Study Area
  - Tutors available throughout the day

Attendance Policy

Your active participation in this course is expected and required for you to learn the material and earn a passing grade. Students with a good attendance record receive an exemption from turning in the weekly homework assignments. This exemption is lost If you miss three class meetings. It can be regained by attending five consecutive class meetings and achieve 80% on a homework assignment. If you miss more than 20 class meetings throughout the term, you will be administratively dropped from the course.

Academic Integrity Statement

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

Americans with Disabilities Act Statement

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Office of Disability Services, 450-3613.

Sexual Harassment and Academic Policies Statement

All students are required to familiarize themselves with the University of Central Arkansas policy on sexual harassment and on academic policies. These policies are printed in the Student Handbook.

Building Emergency Plan Statement

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at http://uca.edu/mysafety/bep/. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.