暨南大學
JINAN UNIVERSITY

0701M110

Calculus I

Instructor: TBA

E-mail: TBA

Office Hours: by appointment on Zoom

Contact Hours: 60 (50 minutes each)

Credits: 4

Course Description

Review of algebraic and trigonometric functions and their graphs, the concepts of limit and continuity, theory and techniques of differentiation, and applications of differentiation, introduction to the theory and techniques of integration.

Required Textbook(s)

Calculus, 10th Edition, Ron Larson. ISBN: 1285057090

Prerequisites

Students are assumed to have taken and passed a pre-calculus course. In particular, students should be proficient in high school algebra and geometry, as well as trigonometry. Moreover, they should have studied exponential and logarithmic functions.

Course Goals

By the end of the course, students will be able to:

- Analyze and assess limits and continuity – find function limits through graphical,

numerical, and analytical approaches; recognize one-sided and infinite limits; and use the continuity definition to examine and categorize points of discontinuity in functions.

- Differentiate functions using core methods – employ the limit definition of the derivative; apply the power, product, quotient, and chain rules; carry out implicit differentiation; and solve problems related to rates of change and related rates in applied settings.
- Examine function behavior using derivatives – locate and classify extreme values; use Rolle's Theorem and the Mean Value Theorem; identify intervals where functions increase or decrease, determine concavity and inflection points; apply the First and Second Derivative Tests; and solve optimization problems.
- Use integration concepts in geometric and analytical contexts – determine antiderivatives and compute definite and indefinite integrals via substitution; interpret Riemann sums and areas under curves; implement the Fundamental Theorem of Calculus; and apply integrals to calculate accumulated values.
- Differentiate and integrate exponential and logarithmic functions and use calculus methods in growth models – find derivatives and integrals involving natural and general exponential or logarithmic bases; model exponential growth and decay processes; and apply L'Hôpital's Rule for evaluating indeterminate limits.

Course Outline

Please note that the outline is meant to give an overview of the major concepts in this course. Changes may occur as needed to aid in the student`s development.

Module 1

- 1.2: Finding Limits Graphically and Numerically
- 1.3: Evaluating Limits Analytically
- 1.4: Continuity and One-Sided Limits
- **Homework 1**
- **Quiz 1**

Module 2

- 1.5: Infinite Limits

- 2.1: The Derivative and the Tangent Line Problem
- **Homework 2**
- **Quiz 2**

Module 3

- 2.2: Basic Differentiation Rules and Rates of Change
- 2.3: Product and Quotient Rules and Higher-Order Derivatives
- 2.4: The Chain Rule
- 2.5: Implicit Differentiation
- **Homework 3**
- **Quiz 3**

Module 4

- 2.6: Related Rates
- 3.1: Extrema on an Interval
- 3.2: Rolle's Theorem and the Mean Value Theorem
- **Homework 4**
- **Quiz 4**
- **Exam 1**

Module 5

- 3.3: Increasing and Decreasing Functions and the First Derivative Test
- 3.4: Concavity and the Second Derivative Test
- 3.5: Limits at Infinity
- **Homework 5**
- **Quiz 5**

Module 6

- 3.6: A Summary of Curve Sketching
- 3.7: Optimization Problems
- **Homework 6**
- **Quiz 6**

Module 7

- 4.1: Antiderivative and Indefinite Integration
- 4.2: Area
- 4.3: Riemann Sums and Definite Integrals
- 4.4: The Fundamental Theorem of Calculus
- **Homework 7**
- **Quiz 7**

Module 8

- 4.5: Integration by Substitution
- 5.1: The Natural Logarithmic Function: Differentiation
- 5.2: The Natural Logarithmic Function: Integration
- **Homework 8**
- **Quiz 8**
- **Exam 2**

Module 9

- 5.4: Exponential Functions: Differentation and Integration
- 5.5: Bases Other than e and Applications
- 6.2: Growth and Decay
- 8.7: Indeterminate Form and L'Hopital's Rule
- **Homework 9**
- **Quiz 9**
- **Final Exam**

Grading Policy

Your grade in this course will be determined by your performance in the following categories:

Homework	15 %
Quizzes (Top 8 out of 9)	20 %
Exams	40 %
Final Exam	25 %
Total	**100%**

Since a quiz is being dropped, there will be absolutely no rounding of your final grade. For each assignment, you have two days from the day the grade is posted to the course site to challenge its grading. Failure to challenge the grading in this time frame will result in the grade being final. You may track your running point total throughout the term via our course site. Please be aware, however, that the course grade you see on the site will reflect only assignments and activities you have already completed and that your professor has graded.

Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90~100
Good	B	80~89
Satisfactory	C	70~79
Poor	D	60~69
Failed	E	Below 60

Academic Integrity

As members of the Jinan University academic community, students are expected to be honest in all of their academic coursework and activities. Academic dishonesty, includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e., misrepresenting as one's own work any work done by another; submitting the same paper, or a substantially similar paper, to meet the requirements of more than one course without the approval and consent of the instructors concerned; or sabotaging other students' work within these general definitions. Instructors, however, determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties that range from the lowering of their course grade to awarding a grade of E for the entire course.