

## MATH 100: Business Calculus I

### General Information:

<b>Term: 2021 Winter Session</b>
<b>Instructor: Staff</b>
<b>Language of Instruction: English</b>
<b>Classroom: TBA</b>
<b>Office Hours: TBA</b>
<b>Class Sessions Per Week: 6</b>
<b>Total Weeks: 4</b>
<b>Total Class Sessions: 25</b>
<b>Class Session Length (minutes): 145</b>
<b>Credit Hours: 4</b>

### Course Description:

This course introduces standard calculus for business courses. Designed for business major students with a college algebra background, this course will focus on the use of derivatives and integrals of linear and non-linear functions, fundamental calculus theory, derivative test and optimization in solving problems in business and economics, e.g., maximizing profit, calculating average investment income, future value of an income stream, and consumers' surplus. Limits and continuity, probability and statistics will also be covered.

### Course Materials:

#### Textbook:

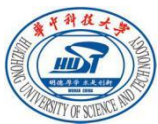
Calculus Concepts: An Informal Approach to the Mathematics of Change, Donald R. LaTorre et al., 5th Edition, 2013

#### Calculator:

The TI-84 (TI-84 Plus) calculator is required.

### Course Format and Requirements:

This course is a combination of lectures, class discussion on examples and exercises. You are responsible for all material and information from class. Attendance is required. Three or more unexplained absences will lower your final grade.



## Course Assignments:

### Homework

Homework exercises should be done by the next class after they are assigned. It's important to finish all assigned homework because some of the questions on exams and quizzes will be based on homework exercises.

### Quizzes

There will be 6 quizzes administered through the whole semester and the lowest scores will be dropped. Quizzes will always be completed in the first ten minutes of class. Quizzes will tend to cover topics covered in the lecture as well as topics covered in the homework.

There will be no make-up quizzes.

### Midterm Exams

There will be two midterm exams in this course. The midterm exam will be based on concepts covered in class. It will be in-class, close-book and non-cumulative.

### Final Exam

The final will be cumulative and close-book. Note that the final will not be taken during the normal class times. Exact time and location for final will be announced later.

## Course Assessment:

Quizzes	15%
Homework	10%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	35%
<b>Total</b>	<b>100%</b>

## Grading Scale (percentage):

**A+: 98%-100%**

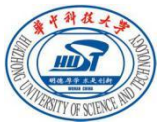
**A: 93%-97%**

**A-: 90%-92%**

**B+: 88%-89%**

**B: 83%-87%**

**B-: 80%-82%**



**C+: 78%-79%**

**C: 73%-77%**

**C-: 70%-72%**

**D+: 68%-69%**

**D: 63%-67%**

**D-: 60%-62%**

**F: Below 60%**

### **Course Schedule:**

Class 1

Course Overview;

Go through Syllabus;

Function;

Continuity;

Limits;

Class 2

Average rate of change;

Using the TI-84

Tangent line and the derivative;

Class 3

Differentiability

Numerical Derivatives;

Graphical Derivatives;

Class 4

#### **Quiz 1**

Algebraic Derivatives

Linear & Quadratic Functions;

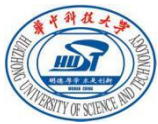
Use supply, demand, revenue, cost, and profit terminology in constructing and evaluating functions;

Class 5

Exponential Functions;

Continuously Compounded Interest

Derivatives of Exponential Functions;



Class 6

**Quiz 2**

Logarithm Functions;  
Second-Order Derivative;  
Higher-Order Derivatives

Class 7

Limit definition of the derivative;  
Numerical & Graphical Limits;  
Algebraic Limits;  
More Deriv. Rules

Class 8

**Midterm Exam 1**

Class 9

Marginal Analysis;  
Chain rule;  
Product & Quotient Rules

Class 10

Marginal Revenue, Marginal Cost, Marginal Profit  
Optimization Critical points, Relative and Absolute Extreme points

Class 11

**Quiz 3**

Max/Min Applications;  
First Derivative Test;  
Second derivative and concavity Second Derivative Test

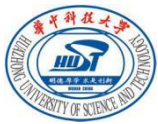
Class 12

Inflection Points;  
Point of diminishing returns;  
Optimization using the calculator;  
Finding inf. pts. with the TI-84

Class 13

**Quiz 4**

The general anti-derivative;



Finding a specific anti-derivative;  
Word problems on antiderivatives

Class 14  
The Indefinite Integral;  
Integration with Initial Conditions

Class 15  
The definite integral;  
Accumulated Change;  
Properties of the definite integral

Class 16  
**Midterm Exam 2**

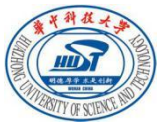
Class 17  
Fundamental Theorem of Calculus;  
Techniques of Integration  
More Integration Formulas;  
Interpreting definite integrals

Class 18  
Area under a curve, Area approximation by rectangles;  
Consumers' and Producers' Surplus

Class 19  
**Quiz 5**  
Average value of a function;  
Average value of the rate of change;  
Continuous income streams, and average value

Class 20  
Differentials;  
Antiderivative Review;  
Integration by u-substitution  
Basic Concepts of Probability;

Class 21  
Conditional Probability;



Independent Events;  
Bayes' Formula

Class 22

**Quiz 6**

Permutations and Combinations;  
Applications of Counting  
Binomial Probability;  
Markov Chains;

Class 23

Probability Distributions;  
Expected Value;  
Decision Making  
Frequency Distributions;

Class 24

Measures of Central Tendency;  
Measures of Variation;  
Normal Distributions;  
Binomial Distributions

Class 25

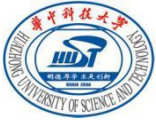
Wrap-up  
Review for final

**Final Exam (Cumulative): TBA**

**Academic Integrity:**

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Huazhong University of Science & Technology's *Academic Conduct Code*. Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.



### **Special Needs or Assistance:**

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.