



**University of International Business and Economics
International Summer School**

MAT 110 Calculus I

Term: July 10 – August 4, 2017

Instructor: SEMA SALUR

Home Institution: UNIVERSITY OF ROCHESTER

Email: semasalur@gmail.com

Class Hours: Monday through Friday, 120 minutes each day (2,400 minutes in total)

Office Hours: TBC

Teaching Assistant: TBD

Email: TBD

Discussion session: 2 hours each week

Total Contact Hours: 64 contact hours (45 minutes each, 48 hours in total)

Credit: 4 units

Course Description

Analysis of the elementary real functions: algebraic, trigonometric, exponentials and their inverses and composites. Their graphs and derivatives. Topics include limits, continuity, asymptotes, the definition of the derivative, derivatives and derivative rules for algebraic, trigonometric, exponentials, and logarithms. Implicit differentiation, related rates, linear approximation, differentials, mean value theorem, maxima and minima, curve sketching, l'Hospital's rule, the definite integral, the fundamental theorem of calculus, and the substitution rule for integration.

Course Goals

- ✧ Calculate limits of functions; explain the relationship between a function and its graph and its limit at a point.
- ✧ Define a derivative using limits and explain its geometric significance; evaluate derivatives of various functions.
- ✧ Analyze the connection between derivatives and integrals in the context of the Fundamental Theorem of Calculus.
- ✧ Evaluate basic integrals using antiderivatives and substitution; recognize the geometric significance of an integral.

Required Text

Calculus: Early Transcendentals, 8th edition by James Stewart

Attendance

Students are expected to be present at all class meetings and examinations



Grading Policy

There will be daily quizzes, two midterms and one final exam in this class. All exams will be closed-book. No notes, calculators, or other electronic devices will be allowed, and having such a device in view during the exam is an academic honesty violation.

Assignments and examinations will be graded according to the following grade scale:

- A 90-100
- A- 85-89
- B+ 82-84
- B 78-81
- B- 75-77
- C+ 72-74
- C 68-71
- C- 64-67
- D 60-63
- F below 60

Grading Scale

The course grades will be calculated based on the following percentages:

- ✧ Quizzes: 20%
- ✧ Midterm 1: 20%
- ✧ Midterm 2: 20%
- ✧ Final Exam: 40%

The final exam will be cumulative. There will be no make-up exams.

Course Hours

The course has 20 class sessions in total. Each class session is 120 minutes in length for a total of 2,400 minutes of class time. The course meets from Monday to Friday.

Class Rules

All academic work should be done with the high level of honesty and integrity. Academic misconduct of any kind may result in a grade penalty or the assignment of a failing grade.

Course Schedule

Week of July 10

Topics

Appendix A: Numbers, Inequalities, and Absolute Values

Supplementary Problems: 11, 13, 21, 33, 44, 51

Appendix B: Coordinate Geometry and Lines

Supplementary Problems: 3, 9, 23, 29, 34, 35, 45, 51, 57

Appendix D: Trigonometry

Supplementary Problems: 3, 9, 13, 23, 25, 65, 67

Section 1.3: New Functions from Old Functions

Supplementary Problems: 3, 29, 32, 39, 41, 43, 50

Section 1.4: Exponential Functions

Supplementary Problems: 7, 12, 15, 17, 29(abc)



Section 1.5: Inverse Functions and Logarithms
Supplementary Problems: 21, 23, 25, 35, 38, 49
Section 2.1: The Tangent and Velocity Problems
Supplementary Problems: 3, 5
Section 2.2: The Limit of a Function
Supplementary Problems: 1, 3, 5, 9, 11, 15, 25, 31
Section 2.3: Calculating Limits Using the Limit Laws
Supplementary Problems: 1, 10, 11–23 (odd), 35, 37, 57, 63
Section 2.5: Continuity
Supplementary Problems: 3, 17, 20, 39, 43, 45, 47, 50
Section 2.6: Limits at Infinity; Horizontal Asymptotes
Supplementary Problems: 3, 5, 13–31 (odd), 63
Section 2.7: Derivatives and Rates of Change
Supplementary Problems: 5, 9, 11, 15, 17, 27, 29, 47
Section 2.8: The Derivative as a Function
Supplementary Problems: 2, 5, 9, 13, 17, 25, 27, 29, 35, 37, 43, 47

Week of July 17

Midterm 1: Date TBD

Topics

Section 3.1: Derivatives of Polynomials and Exponential Functions
Supplementary Problems: 5, 6, 7, 15–23 (odd), 31, 49, 53, 65
Section 3.2: The Product and Quotient Rules
Supplementary Problems: 3–25 (odd), 44, 49, 51, 54
Section 3.3: Derivatives of the Trigonometric Functions
Supplementary Problems: 3, 5, 9, 14, 17, 38, 39, 41, 43, 44
Section 3.4: The Chain Rule
Supplementary Problems: 5, 7, 9, 13, 15, 23, 32, 41, 43, 49, 53, 61, 65, 72, 80
Section 3.5: Implicit Differentiation
Supplementary Problems: 3, 8, 11, 17, 21, 27, 39, 45, 50, 51, 59, 71
Section 3.6: Derivatives of Logarithmic Functions
Supplementary Problems: 3, 4, 7, 8, 11, 23, 37, 39, 40, 49
Section 3.7: Rates of Change in the Natural and Social Sciences
Supplementary Problems: 1, 8, 12, 13, 20, 26, 30

Week of July 24

Midterm 2: TBD

Section 3.8: Exponential Growth and Decay
Supplementary Problems: 3, 7, 9, 12, 15, 19
Section 3.9: Related Rates
Supplementary Problems: 3, 10, 13, 15, 17, 19, 24, 33, 41
Section 3.10: Linear Approximation and Differentials
Supplementary Problems: 2, 5, 11, 22, 23, 25, 27, 35, 39, 41(e)
Section 4.1: Maximum and Minimum Values
Supplementary Problems: 3, 7–19 (odd), 31, 34, 39, 50, 55, 59, 63, 70
Section 4.2: The Mean Value Theorem
Supplementary Problems: 4, 5, 11, 17, 23, 25
Section 4.3: How Derivatives Affect the Shape of a Graph
Supplementary Problems: 5, 8, 11, 15, 23, 25, 31, 41, 45, 67, 86



Section 4.4: Indeterminate Forms and L'Hospital's Rule
Supplementary Problems: 5–11 (odd), 17–23 (odd), 37, 42, 49, 53, 55, 56, 76

Week of July 31

Section 4.5: Summary of Curve Sketching
Supplementary Problems: 3, 13, 18, 33, 44
Section 4.7: Optimization Problems
Supplementary Problems: 2, 5, 12, 18, 23, 27, 39, 42, 53
Section 4.9: Antiderivatives
Supplementary Problems: 3, 13, 15, 21, 35, 37, 45, 49, 53, 59, 61, 66, 73
Section 5.1: Areas and Distances
Supplementary Problems: 4, 15, 17, 20, 23
Section 5.2: The Definite Integral
Supplementary Problems: 1, 5, 7, 19, 29, 33, 35, 36, 42, 43, 47, 49, 54, 55
Section 5.3: The Fundamental Theorem of Calculus
Supplementary Problems: 4, 5, 7–17 (odd), 23, 31, 36, 37, 43, 57, 63, 67, 78
Section 5.4: Indefinite Integrals and the Net Change Theorem
Supplementary Problems: 7, 10, 12, 16, 27, 31, 37, 43, 49, 52, 59, 69
Section 5.5: The Substitution Rule
Supplementary Problems: 7, 10, 12, 19, 27, 31, 35, 43, 59, 65, 72, 81
Final Exam