Mathematics Department
Molloy University
MAT 2210 Calculus 1 (4 Credits)

CATALOG DESCRIPTION: Linear, exponential, logarithmic, power, polynomial and rational functions; inverse functions; trigonometric functions; limits and continuity; derivative definition and formulas; maxima and minima, concavity, curve sketching; definite and indefinite integrals; applications. (formerly MAT 221; MAT 125; formerly Analytic Geometry and Calculus I)

Course Learning Outcomes: Upon successful completion of MAT 2210–Calculus 1, a student will be able to:

- Determine limits and continuity analytically and graphically
- Determine derivatives of functions using a variety of techniques and differentiate implicitly
- Examine various techniques of derivatives and apply them to a variety of models
- Evaluate indefinite and definite integrals
- Use integrals to determine area under and between curves

PREREQUISITES: Algebra 2 and Trigonometry

REQUIRED TEXT: *Calculus* 3rd Edition. All topics correspond to the chapters/sections in this text

Authors: Jon Rogawski and Colin Adams

Publisher: W.H. Freeman and Company

REQUIRED SUPPLIES: TI-84 Plus CE (or any other) graphing calculator

GRADING: Semester 1 (35%): ⅓ Classroom Tests, ⅓ Homework and Quizzes, ⅓ Semester 1 Exam
Semester 2 (35%): ½ Homework and Quizzes, ½ Tests
Final Comprehensive Exam: 30% of final grade

Grade Conversion Chart:

A	93.0-100
A–	90.0-92.9
B+	87.0-89.9
B	83.0-86.9
B–	80.0-82.9
C+	77.0-79.9
C	73.0-76.9
C–	70.0-72.9
D+	67.0-69.9
D	60.0-66.9
F	Failure Below 60.0

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TOPICS:

Semester 1/Trimester 1:

Preliminary Chapter - Trigonometry and radian measure review.

P-01 Calculator Features
P-02 Graphing on the Calculator
P-03 Expanding our Knowledge of Trig
P-04 Trig Proofs
P-05 Logarithms and exponentials /Natural log and ln

Chapter 1 - Limits

1-01 Simple Graphs, Useful Terms and a New Notation
1-02 Evaluating Limits Analytically
1-03 More Analytic Techniques for Evaluating Limits
1-04 The Difference Quotient Formula
1-05 Special Limits, Part A – One-Sided Limits
1-06 Special Limits, Part B – Infinite Limits and Limits at Infinity
1-07 Special Limits, Part C – Interesting and Unusual Limits
1-08 Continuity
1-09 The Intermediate Value Theorem
1-10 Definition of the Limit, Epsilonics
1-11 Graphing Piecewise Functions

Chapter 2 – Differentiation

2-01 The Tangent Line Problem
2-02 Basic Differentiation Rules
2-03 Rates of Change, Part 1
2-04 The Product and Quotient Rules for Derivatives
2-05 Derivatives of Trigonometric Functions, Logarithms and natural log.
2-06 Higher Order Derivatives
2-07 The Chain Rule
2-08 Tangent Lines and Harmonic Motion
2-09 Implicit Differentiation

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Semester 2/Trimester2 & 3 :

Chapter 3 – Applications of Derivatives

3-01 Applications of Derivatives -Critical Points, Intervals, Derivative Tests, Concavity, Inflection
3-02 Optimization (Part 1)
3-03 Optimization (Part 2-Finance and Economics)
3-04 Differentials
3-05 Related Rates
3-07 Important Theorems for Derivatives

Chapter 4 - Integration

4-01 Partitions and Sigma Notation
4-02 Antiderivatives
4-03 Riemann Sums
4-04 Definite Integral
4-05 Properties of Integrals and Integration of ln and e.
4-06 Area Under the Curve
4-07 Area Between Two Curves
4-08 Integration Using Graphs
4-09 U-Substitution

****All students must have TI-84 Plus, Silver Edition Calculator**