

**LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING AND COMPUTER SCIENCE**

MAT242 Technical Mathematics 2

4 Hours; 4 Credits

Prerequisite: MAT241 or Waiver

CATALOG DESCRIPTION:

This is the second course in the Technical Mathematics sequence. Scientific methods of differential calculus are developed and applied to solving practical problems. Topics include differentiation and integration of algebraic, exponential, logarithmic and trigonometric functions, curve sketching, rectilinear motion, extrema, area and volume.

INSTRUCTIONAL OBJECTIVES:

1. Reinforce the student's knowledge of analytic geometry, trigonometry and the exponential and logarithmic functions.
2. Introduce the students to concept of derivatives as slopes of tangent to curve and as rates of change.
3. Familiarize the students with the use of derivatives in solving practical problems and curve sketching.
4. Introduce the students to indefinite/definite integrals.
5. Enable the students to use integrals to evaluate areas and volumes and to solve rectilinear motion problems.
6. Provide the students with a historical background of the terms and concepts that will enhance their understanding of the subject matter.
7. Provide the students with the opportunity to experience different methods of solving problems through the cultural diversity and educational background of the class.

PERFORMANCE OBJECTIVE:

At the conclusion of the course, students will be able to:

1. Calculate derivatives of algebraic, exponential, logarithmic and trigonometric functions.
2. Calculate integrals of polynomials, (special) rational, exponential, logarithmic and trigonometric functions.
3. Use derivatives to aid curve sketching.
4. Solve simple extrema problems.
5. Solve rectilinear motion problems.
6. Evaluate areas of bounded regions and volumes of typical geometric solids.
7. Demonstrate understanding of historical background of terms and concepts.

Note: Particular attention will be placed on application-oriented problems.

GRADING:

3 Exams	45%
2 Projects	20%
Homework	10%
FINAL	25%

ATTENDANCE: Attendance is mandatory. Excessive absenteeism (more than 6 classes) may result in a WU or an F grade. No class should be missed unless absolutely necessary.

TEXTBOOK: Basic Technical Mathematics with Calculus, 10th edition,
By Allyn J. Washington, Pearson

TECHNICAL MATH 2 (MAT242)

WEEK	LESSON	TOPIC
Week 1	1	Functions (Review)
	2	23.1 Limits
	3	23.2 The slope of the tangent to a curve
	4	23.3 The Derivative
Week 2	5	23.4 Derivatives as an Instantaneous Rate of Change
	6	23.5 Derivatives of Polynomials
	7	23.6 Derivatives of Product and Quotient Rules
	8	23.7 Derivatives of a Power of a Function
Week 3	9	23.8 Differentiation of Implicit Functions
	10	23.9 Higher Derivatives
	11	24.1 Tangents and Normals
	12	Review
Week 4	13	Test 1
	14	24.4 Related Rates
	15	24.5 Using Derivatives in Curve Sketching
	16	24.6 More on Curve Sketching
Week 5	17	24.7 Applied Maximum and Minimum Problems
	18	More on Applied Extrema Problems
	19	24.8 Differentials and Linear Approximations
	20	25.1 Anti-derivatives
Week 6	21	25.2 The Indefinite Integral
	22	25.3 The Area Under a Curve
	23	25.4 The Definite Integral
	24	25.5 Numerical Integration: The Trapezoidal Rule
		Review
Week 7	25	Mid-term
	26	26.1 Applications of the Indefinite Integral
	27	26.2 Areas by Integration
	28	26.3 Volumes by Integration
Week 8	29	More on Volumes
	30	Review of Basic Trigonometric Relations
	31	27.1 Derivatives of the sine and cosine Functions
	31	27.2 Derivatives of the other Trigonometric Functions
Week 9	33	27.3 Derivatives of the Inverse trigonometric Functions
	34	27.4 Applications
	35	Review of Exponential and Logarithmic Functions
	36	27.5 Derivative of the Logarithmic Function
10	37	27.6 Derivative of the Exponential Function
	38	27.7 L'Hopital's Rule
	39	27.8 Applications
	40	Review Test 3
Week 11	41	28.1 The General Power Formula
	42	28.2 The Basic Logarithmic Form
	43	28.3 The Exponential Form
	44	28.4 Basic Trigonometric Form
12 Week	45	28.5 Other Trigonometric Forms
	46	28.7 Integration by Parts
	47	Integration By Parts (continued)
	48	Review
Final Week	Final	Cumulative Examination