MATH 111: Calculus I
Spring 2025 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: Topics include limits, differentiation, applications of differentiation, and integration

Number of Credits: 4

Prerequisites: MATH 110 or placement by performance on standardized entrance examinations.

Course-Section and Instructors:

Course-Section	Instructor
Math 111-002	Professor B. Mafarjeh
Math 111-004	Professor B. Mafarjeh
Math 111-006	Professor J. Davis
Math 111-008	Professor J. Davis
Math 111-010	Professor M. Sampedro
Math 111-012	Professor J. Jaquette
Math 111-014	Professor A. Elassa
Math 111-018	Professor J. DeGroot
Math 111-020	Professor J. DeGroot
Math 111-022	Professor I. Peltekov

Math 111-024	Professor I. Peltekov
Math 111-102	Professor S. Porterfield-Jackson

Office Hours for All Math Instructors: Spring 2025 Office Hours and Emails

Required Textbook:

Title	*Thomas' Calculus: Early Transcendentals*
Author	Hass, Heil, and Weir
Edition	15th
Publisher	Pearson
ISBN #	9780137559893 9780137560042

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 7, 2025**. It will be strictly enforced.

STUDENT RESPONSIBILITIES

- Read and understand the syllabus.
- Adhere to all policies and procedures
- Report conflicts and/or special circumstances in a timely manner
- Report any instances of violations of Academic Integrity to your Instructor
- Communicate directly with your Instructor on ALL course-related matters, including material, procedures, policies and exams. **NOTE: Do not attempt to contact other instructors or the course Coordinator - you will not get a response. All course information will be communicated to you directly by your instructor.**
- Effectively manage time and devote sufficient time to succeeding in this course
- Keep track of your grades
- Make use of all resources available to help you learn
- Be respectful of peers and your instructor
- Accept responsibility for your grades – requests for extra credit opportunities will be denied

COURSE GOALS

Course Objectives

- Students should (a) learn about limits and their central role in calculus, (b) learn about derivatives and their relationship to instantaneous rates of change, (c) understand many practical applications of derivatives, (d) gain experience in the use of approximation in studying mathematical and scientific

problems, (e) learn about integrals: their origin in the area problem and their relationship to derivatives.
- Students should gain an appreciation for the importance of calculus in scientific, engineering, computer, and other applications.
- Students should gain experience in the use of technology to facilitate visualization and problem solving.

Course Outcomes

- Students have improved logical thinking and problem-solving skills.
- Students have a greater understanding of the importance of calculus in science and technology.
- Students are prepared for further study in mathematics as well as science, engineering, computing, and other areas.

Course Assessment: The assessment of objectives is achieved through homeworks, quizzes, and common examinations with common grading.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Quizzes and Homework	17%
Common Midterm 1	17%
Common Midterm 2	17%
Common Midterm 3	17%
Final Exam	32%

Your final letter grade will be based on the following tentative curve.

A	88 - 100	**C**	66 - 71
B+	83 - 87	**D**	60 - 65
B	77 - 82	**F**	0 - 59
C+	72 - 76		

THE FINAL GRADE DISTRIBUTION WILL BE DETERMINED BY COURSE INSTRUCTORS IN A MEETING TO BE HELD AFTER THE FINAL EXAM.

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the Math Department's Attendance Policy. This policy will be strictly enforced. Each class is a learning experience that cannot be replicated through simply "getting the notes."

Religious Observance: NJIT is committed to supporting students observing religious holidays. Students must

notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

Homework: Homework is a requirement for this class. Online homework will be completed with MyMathLab, which comes with a new copy of the textbook. Access to it can also be purchased directly from the website.

Generative AI: This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. AI usage is not permitted throughout this course under any circumstance. Violation of the policy will result in a grade of zero on any impacted assignment(s) and will be reported to the dean of students for supplemental discipline.

Quizzes: Quizzes will be given approximately once a week throughout the semester. They will be based on the lecture, homework and the in-class discussions.
Exams: There will be three common midterm exams held during the semester and one comprehensive common final exam. Common Midterm Exams will be held on the following days:

Midterm Exam 1	February 12, 2025
Midterm Exam 2	March 12, 2025
Midterm Exam 3	April 16, 2025
Final Exam Period	May 10 - May 16, 2025

The time of the midterm exams is **4:15pm - 5:40 PM** for daytime students and **6:00 - 7:25 PM** for evening students. The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the Math Department's Examination Policy. This policy will be strictly enforced.

Makeup Exam Policy: To properly report your absence from a midterm or final exam, please review and follow the required steps under the DMS Examination Policy found here:

http://math.njit.edu/students/policies_exam.php

Mandatory Tutoring Policy: Based upon academic performance indicating a significant gap in understanding of the course material, students may receive a notice of being assigned to mandatory tutoring to assist in filling the gap. A student will have 2 points deducted from the course average for each instance in which the required tutoring is not completed by the stated deadline.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2025 Hours)

Further Assistance: The Office of Accessibility Resources and Services (OARS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please If you need an accommodation due to a disability please contact the Office of Accessibility Resources and Services at oars@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Office of Accessibility Resources and Services (OARS) website at:

https://www.njit.edu/accessibility/

For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for Instructor Office Hours and Emails.

Important Dates (See: Spring 2025 Academic Calendar, Registrar)

Date	Day	Event
January 21, 2025	Tuesday	First Day of Classes
January 27, 2025	Monday	Last Day to Add/Drop Classes
March 16, 2025	Sunday	Spring Recess Begins
March 22, 2025	Saturday	Spring Recess Ends
April 3, 2025	Thursday	Wellness day
April 7, 2025	Monday	Last Day to Withdraw
April 18, 2025	Friday	Good Friday - No Classes
April 20, 2025	Sunday	Easter Sunday - No Classes Scheduled
May 6, 2025	Tuesday	Thursday Classes Meet
May 7, 2025	Wednesday	Friday Classes Meet
May 7, 2025	Wednesday	Last Day of Classes
May 8, 2025	Thursday	Reading Day 1
May 9, 2025	Friday	Reading Day 2
May 10 - May 16, 2025	Friday to Thursday	Final Exam Period

Course Outline

Lecture	Sections	Topic	Assignment in MyMathLab
1	2.1	Rates of Change and tangents to Curves	1,5,9,13,25
2	2.2	Limit of a Function and Limit Laws	1,2,13,19,22,25,31,33,35,41,47,49, 53,57,63,79,81
3	2.4	One Sided Limits	3,5,9,13,15,17,27,29,31,37,41

4	2.5	Continuity	3,5,7,15,17,21,25,27,29
5	2.5/2.6	Continue Continuity; start Infinite limits	Section 2.5: 35,37,39,45,47,49,53,59,65
6	2.6	Limits Involving Infinity; Asymptotes	7,9,11,23,25,27,31,33,43,45,49,53,63, 67,89,91,105,107
7	3.1	Tangents and Derivatives at a Point	11,13,15,17,21,35
8	3.2	The Derivative as a Function	1,3.5,13,26,33,39,41
9	3.3	Differentiation Rules	5,7,19,25,31,39,41,43,45
10		**REVIEW FOR EXAM 1**	
11	3.3	Differentiation Rules	47,53,55,57,59,62,63,74
12	3.4	Derivatives as a Rate of Change	1,5,7,10,13,17,21,23,29
13	3.5	Derivatives of Trig Functions	2,12,15,16,19,26,29,33,35,55
14	3.6	The Chain Rule	5,17,23,25,29,33,35,39,43,47,49,51,61,63,65,67
15	3.6/3.7	Continue Chain Rule; start Implicit Differentiation	Section 3.6: 71,77,81,83,85,89,97,101
16	3.7/3.8	Continue Implicit Differentiation; start Derivatives of Inverses and Logs	Section 3.7: 1,7,11,15,16,17,19,23,33,39,41
17	3.8	Derivatives of Inverse and Log Functions	7,9,17,25,28,33,35,39,43,47,61,65,67,69,73,87,93,99
18	3.9	Inverse Trig Functions	5,11,21,23,31,33,34,37,41
19	3.10	Related Rates	7,11,15,17,21,23,25
20	3.10/3.11	Continue Related Rates; Start Linearization	Section 3.10: 27,31,33,37,40,41
21	3.11/4.1	Continue Linearization and Differentials; start Extreme Values	Section 3.11: 5,11,13,19,31,35,41,51,53,59
22		**REVIEW FOR EXAM 2**	
23	4.1	Extreme Values of Functions	7,25,29,33,35,41,47,49,50,51,70
24	4.2	The Mean Value Theorem	3,4,5,6,11,13,16,21
25	4.2/4.3	Continue Mean Value Theorem; Start Monotone Functions and the First Derivative Test	Section 4.2: 31,35,37,41,45,47,49,51,56
26	4.3/4.4	Continue the First Derivative Test; start Concavity and Curve Sketching	Section 4.3: 11,13,21,29,37,41,43,51,63,77,79
27	4.4	Concavity and Curve Sketching	7,13,19,23,37,43,46,51,55,59,61,113,123
28	4.5	Indeterminate Forms & L'Hopitals Rule	7,9,11,15,21,23,25,31,35,39,43,46,48,51

29	4.5/4.6	Finish L'Hopitals; Start Applied Optimization	Section 4.5: 53,57,59,60,65,67,69,73,81
30	4.6	Applied Optimization	4,7,9,11,12,14,23,31,46,47,59,64
31	4.7	Newton's Method	1,2,5,23
32	4.8	Antiderivatives	5,11,19,35,37,39,41,45,47,54,59,61,69,97,101,104, 107,113,127
33		**REVIEW FOR EXAM 3**	
34	5.1	Area and Estimating with Finite Sums	1,5,8,9,11
35	5.2	Sigma Notation and Limits of Finite Sums	7,9,17,25,29,37,42,43,47
36	5.3	Definite Integral	1,9,13,21,22,33,42,45
37	5.3/5.4	Continue Definite Integrals; start Fundamental Theorem of Calculus	Section 5.3: 57,59,61,71,79,88
38	5.4	Fundamental Theorem of Calculus	7,9,13,15,21,23,27,30,41,47,53,55,57,60,61,63,77,79
39	5.5	Indefinite Integrals and Substitution Method	11,15,18,20,21,23,25,26,27,29,33
40	5.5/5.6	Finish Indefinite Integrals and Substitution Method; start Substitution and Area Between Curves	Section 5.5: 37,43,47,53,55,59,63,65,79
41	5.6	Substitution and Area Between Curves	3,12,17,19,27,29,33,39,53,66,71,77,83,87,93,97,99, 102,119
42		**Review for Final**	
		FINAL EXAM	