

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 111: Calculus I

Summer 2024 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 111-031	Professor M. Potocki-Dul
Math 111-131	Professor M. Potocki-Dul

Office Hours for All Math Instructors: [Office Hours and Emails](#)

Required Textbook:

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

University-wide Withdrawal Date: Please see the [Summer 2024 Academic Calendar](#) for the last day to withdraw based on the summer session you are registered for.

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:

Homework	10%
Quizzes	10%

Common Midterm 1	25%
Common Midterm 2	25%
Final Exam	30%

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		

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."

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.

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 two common exams and a final. Each exam will test the material taught since the beginning of the semester:

Midterm Exam 1	June 12, 2024
Midterm Exam 2	July 17, 2024
Final Exam Period	August 5, 2024

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: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the Math Department Office/Instructor that the exam will be missed.

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: [Summer 2024 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: [Summer 2024 Academic Calendar, Registrar](#))

Date	Day	Event
May 20, 2024	Monday	Full, First, and Middle Summer Session Begins
May 22, 2024	Wednesday	Last Day to Add/Drop for First Summer Session
May 24, 2024	Friday	Last Day to Add/Drop for Middle Summer Session
May 27, 2024	Monday	Last Day to Add/Drop for Full Summer Session
May 27, 2024	Monday	Memorial Day - University Closed/No Classes Scheduled
June 8, 2024	Saturday	Last Day to Withdraw from First Summer Session
June 21, 2024	Friday	Last Day to Withdraw from Middle Summer Session
June 21, 2024	Friday	Juneteenth - University Closed/No Classes Scheduled
June 24, 2024	Monday	Last Day of Classes for First Summer Session

June 28, 2024	Friday	Last Day to Withdraw from Full Summer Session
July 1, 2024	Monday	Second Summer Session Begins
July 4, 2024	Thursday	Independence Day - University Closed/No Classes Scheduled
July 4, 2024	Thursday	Last Day to Add/Drop for Second Summer Session
July 15, 2024	Monday	Last Day of Classes for Middle Summer Session
July 15, 2024	Monday	Last Day to Withdraw for Second Summer Session
August 3, 2024	Saturday	Last Day of Classes for Second Summer Session
August 5, 2024	Monday	Last Day of Classes for Full Summer Session

Tentative Course Outline

Lec	Sect.#	Subject Topic	Assignment in MyMathLab
1	2.1	<i>Rates of Change and Tangents to Curves</i>	1,5,9,13,25
2	2.2	<i>Limit of a Function and Limit Laws</i>	1,2,13,19,22,25,31,33,35,41,47,49,53,57,63,79,81
2	2.4	<i>One-Sided Limits</i>	3,5,9,13,15,17,27,29,31,37,41,
3	2.5	<i>Continuity</i>	3,5,7,15,17,21,25,27,29,35,37,39,45,47,49,53,59,65
3-4	2.6	<i>Limits Involving Infinity; Asymptotes of Graphs</i>	7,9,11,23,25,27,31,33,43,45,49,53,63,67,89,91,105,107
		<i>Memorial Day Holiday - School Closed</i>	
4	3.1	<i>Tangents and the Derivative at a Point</i>	11,13,15,17,21
5	3.2	<i>The Derivative as a Function</i>	1,3,5,13,26,33,39,41
5	3.3	<i>Differentiation Rules</i>	5,7,19,25,31,39,41,43,45,47,53,55,57,59,62,63,74
6	3.4	<i>The Derivative as a Rate of Change</i>	1,5,7,10,13,17,21,23,29
7	3.5	<i>Derivatives of Trigonometric Functions</i>	2,12,15,16,19,26,29,33,35,55

8	3.6	<i>The Chain Rule</i>	5,17,23,25,29,33,35,39,43,47,49,51,61,63,65,67,71,77,81,83,85,89,97,101
9	3.7	<i>Implicit Differentiation</i>	1,7,11,15,16,17,19,23,33,39,41
10		<i>REVIEW FOR MIDTERM EXAM I</i>	
		<i>MIDTERM EXAM I: June 12, 2024</i>	
11	3.8	<i>Derivatives of Inverse Functions and Logarithms</i>	7,9,17,25,28,33,35,39,43,47,61,65,67,69,73,87,93,99
12	3.9	<i>Inverse Trigonometric Functions</i>	5,11,21,23,31,33,34,37,41
13	3.10	<i>Related Rates</i>	7,11,15,17,21,23,25,27,31,33,37,40,41
14	3.11	<i>Linearization and Differentials</i>	5,11,13,19,31,35,41,51,53,59
15	4.1	<i>Extreme Values of Function</i>	7,25,29,33,35,41,47,49,50,51,70
16	4.2	<i>The Mean Value Theorem</i>	3,4,5,6,11,13,16,21
	4.2	<i>The Mean Value Theorem (Cont'd)</i>	31,35,37,41,45,47,49,51,56
17	4.3	<i>Monotone Functions and the First Derivative Test</i>	11,13,21,29,37,41,43,51,63,77,79
18	4.4	<i>Concavity and Curve Sketching</i>	7,13,19,23,37,43,46,51,55,59,61,113,123
19	4.5	<i>Indeterminate Forms and L'Hopital's Rule</i>	7,9,11,15,21,23,25,31,35,39,43,46,48,51,53,57,59,60,65,67,69,73,81
20	4.6	<i>Applied Optimization</i>	4,7,9,11,12,14,23,31,46,47,59,64
21	4.7	<i>Newton's Method</i>	1,2,5,23
22		<i>REVIEW FOR MIDTERM EXAM II</i>	
		<i>MIDTERM EXAM II: July 17, 2024</i>	
23	4.8	<i>Antiderivatives</i>	5,11,19,35,37,39,41,45,47,54,59,61,69,97,101,104,107,113,127
24	5.1 5.2	<i>Area and Estimating with Finite Sums</i> <i>Sigma Notation and Limits of Finite Sums</i>	5.1: 1,5,8,9,11 5.2: 7,9,17,25,29,37,42,43,47
25	5.3	<i>The Definite Integral</i>	1,9,13,21,22,33,42,45,57,59,61,71,79,88
26	5.4	<i>The Fundamental Theorem of Calculus</i>	7,9,13,15,21,23,27,30,41,47,53,55,57,60,61,63,77,79
27	5.5	<i>Indefinite Integrals and the Substitution Method</i>	11,15,18,20,21,23,25,26,27,29,33,37,43,47,53,55,59,63,65,79
28	5.6	<i>Substitution and Area Between Curves</i>	3,12,17,19,27,29,33,39,53,66,71,77,83,87,93,97,99,102,119
29-30		<i>Review</i>	

31		<i>FINAL EXAM August 5, 2024</i>	
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Updated by Professor M. Potocki-Dul - 4/26/2024
Department of Mathematical Sciences Course Syllabus, Summer 2024