New Jersey Institute of Technology

Digital Commons @ NJIT

Mathematical Sciences Syllabi   NJIT Syllabi

Fall 2024

MATH 111: Calculus I

Mathematical Science Department

Follow this and additional works at: https://digitalcommons.njit.edu/math-syllabi

MATH 111: Calculus I
Fall 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 111-001	Professor J. Davis
Math 111-003	Professor J. Davis
Math 111-005	Professor T. Sherman
Math 111-007	Professor N. Tsipenyuk
Math 111-009	Professor M. Potocki-Dul
Math 111-011	Professor X. Zhao
Math 111-013	Professor I. Peltekov
Math 111-015	Professor I. Peltekov
Math 111-017	Professor J. Adubato
Math 111-019	Professor S. Neris
Math 111-021	Professor T. Sherman
Math 111-023	Professor N. Tsipenyuk
Math 111-025	Professor M. Sampedro
Math 111-027	Professor M. Sampedro

Math 111-029	Professor R. Dandan
Math 111-031	Professor G. Bekhit
Math 111-033	Professor G. Bekhit
Math 111-035	Professor J. Adubato
Math 111-037	Professor K. Horwitz
Math 111-039	Professor A. Elassa
Math 111-041	Professor J. DeGroot
Math 111-043	Professor J. DeGroot
Math 111-045	Professor S. Alptekin
Math 111-101	Professor S. Porterfield-Jackson

Office Hours for All Math Instructors: Fall 2024 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, November 11, 2024**. 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."

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 three common midterm exams held during the semester and one comprehensive common final exam. Common Midterm Exams will be held on the following days:

Common Midterm Exam I	September 25, 2024
Common Midterm Exam II	October 23, 2024
Common Midterm Exam III	November 20, 2024
Final Exam	December 15 - December 21, 2024

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: Fall 2024 Hours)

Further Assistance: 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.

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

If you need an accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation

Eligibility from the office authorizing student accommodations is 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/

Important Dates (See: Fall 2024 Academic Calendar, Registrar)

Date	Day	Event
September 2, 2024	Monday	Labor Day
September 3, 2024	Tuesday	First Day of Classes
September 9, 2024	Monday	Last Day to Add/Drop Classes
November 11, 2024	Monday	Last Day to Withdraw
November 26, 2024	Tuesday	Thursday Classes Meet
November 27, 2024	Wednesday	Friday Classes Meet
November 28 to December 1, 2024	Thursday and Sunday	Thanksgiving Recess - Closed
December 11, 2024	Wednesday	Last Day of Classes
December 12, 2024	Thursday	Reading Day 1
December 13, 2024	Friday	Reading Day 2
December 15 to December 21, 2024	Sunday to Saturday	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	5.1	Area and Estimating with	1,5,8,9,11

		Finite Sums	
34		**REVIEW FOR EXAM 3**	
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	