

MATH 111: Calculus I

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. Effective From: Spring 2013.

Number of Credits: 4

Prerequisites: Math 139 with a grade of B or better, or placement by performance on standardized entrance examinations.

Course-Section and Instructors

Course-Section	Instructor
Math 111-001	Professor J. Hunter
Math 111-003	Professor R. Brown
Math 111-005	Professor R. Kelly
Math 111-007	Professor I. Loughman-Pawelko
Math 111-009	Professor M. Potocki-Dul
Math 111-011	Professor R. Brown
Math 111-013	Professor B. Zhen
Math 111-015	Professor S. Jiang
Math 111-017	Professor J. Zaleski
Math 111-019	Professor S. Afkhami

Math 111-021	Professor V. Barreto Aranda
Math 111-101	Professor J. Hayes

Required Textbook:

Title	Thomas' Calculus: Early Transcendentals
Author	Thomas
Edition	13th
Publisher	Pearson
ISBN #	978-0321981677
Notes	w/ MyMathLab

University-wide Withdrawal Date: Please note that the last day to withdraw with a W is **November 3, 2014**. It will be strictly enforced.

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, Quizzes, Matlab	15%
Common Midterm Exam I	15%
Common Midterm Exam II	20%
Common Midterm Exam III	20%
Final Exam	30%

Your final letter grade will be based on the following tentative curve. NOTE: This course needs to be passed with a grade of C or better in order to proceed to subsequent courses such as **MATH 112**.

A	88 - 100	C	65 - 71
B+	83 - 87	D	60 - 64
B	77 - 82	F	0 - 59
C+	72 - 78		

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. Day sections of Math 111 meet four times a week; there are three lectures and one recitation. Recitation classes provide an additional opportunity for you to seek help with homework and concepts taught in class.

Homework Policy: Calculus is learned by solving problems. In Math 111, there are two kinds of homework assignments: 1) assignments which are written out by hand and turned in, and 2) assignments which are completed online. The homework assignments are listed on the syllabus; the * superscript denotes those problems which constitute the hand-in assignments while the remaining problems constitute the online assignments.

The online assignments can be completed at WWW.MYMATHLAB.COM or WWW.COURSECOMPASS.COM. In order access the online assignments you need to have a student access code. Access codes are included with new book that is bundled with MyMathLab; codes can be purchased separately from the textbook at the campus bookstore or online at the course website. If you buy a new book from another source make sure it is bundled with MyMathLab. In addition, on the first day of class your course instructor will give you an additional code needed to access the online assignments. NOTE: Homework Assignments are DUE frequently (at least weekly) at the dates and times specified online and by your instructor.

How to Get Started with MyMathLab:

- [Getting Started](#)
- [Technology Tips](#)

MATLAB Assignments: MATLAB is a mathematical software program that is used throughout the science and engineering curricula. Two MATLAB assignments will be given during the semester; tutors are available to help

students having difficulties in accordance with a posted [schedule](#).

Quiz Policy: Quizzes are given in class on a frequent basis (at least weekly). All of the quizzes will be graded. The homework and quizzes are intended to develop your problem-solving skills and to help you prepare for the exams.

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

Common Midterm Exam I	September 24, 2014
Common Midterm Exam II	October 22, 2014
Common Midterm Exam III	November 19, 2014
Final Exam	December 15-19, 2014

The time of the midterm exams is 4:15-5:40 pm for daytime students and 5:45-7:10 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.

Please note that electronic devices (such as calculators, cell phones, CD players, etc.) are not allowed during any exam.

Makeup Exam Policy: There will be NO MAKE-UP EXAMS during the semester. In the event the Final Exam is not taken, under rare circumstances where the student has a legitimate reason for missing the final exam, a makeup exam will be administered by the math department. In any case the student must notify the Math Department Office and the Instructor that the exam will be missed and present written verifiable proof of the reason for missing the exam, e.g., a doctors note, police report, court notice, etc., clearly stating the date AND time of the mitigating problem.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in Cullimore, Room 214 (See: [Fall 2014 Hours TBA](#))

Important Dates (See: [Fall 2014 Academic Calendar](#), Registrar)

Date	Day	Event
September 2, 2014	T	First Day of Classes
September 8, 2014	M	End of Add/Drop Period
November 3, 2014	M	Last Day to Withdraw
November 25, 2014	T	Thursday Classes Meet
November 26, 2014	W	Friday Classes Meet

November 27 - 30, 2014	R - S	Thanksgiving Recess Starts
December 10, 2014	W	Last Day of Classes
December 11 & 12, 2014	R & F	Reading Days
December 15 - 20, 2014	M - S	Final Exam Period

Course Outline

<u>Week Dates</u>	Section # + Topic	Lecture # + HW Assignment
1 9/2 - 9/5	2.1: Rates of Change and Tangents to Curves	1 p.64: 1, 3*, 5, 9, 13, 21
	2.2: Limit of a Function and Limit Laws	2 p.74: 1, 13, 19, 22, 25, 31, 32*, 33, 35, 41, 47, 49, 50*, 53, 57, 63, 79, 80*, 81
2 9/8 - 9/13	2.4: One-Sided Limits	3 p.91: 3, 5, 9, 13, 15, 17, 25, 27, 29, 30*, 32*, 35, 39, 45*
	» MATLAB 1	» DUE ON 9/19/14
	2.5: Continuity	4 p.102: 3, 5, 7, 15, 17, 18*, 20*, 21, 25, 27, 29, 30*
	2.5, 2.6: Continuity (cont.) and Limits Involving Infinity; Asymptotes of Graphs	5 p.102: 33, 35, 37, 39, 41, 43, 47, 53, 54*, 55*, 59
3 9/15 - 9/19	2.6: Limits Involving Infinity; Asymptotes of Graphs (cont.)	6 p.115: 7, 9, 11, 23, 25, 27, 30*, 31, 33, 43, 45, 49, 53, 61, 63, 67, 82*, 86*, 99, 103*
	3.1: Tangents and the Derivative at a Point	7 p.126: 11, 13, 15, 17, 21, 34*, 35
	3.2: The Derivative as a Function	8 p.133: 1, 3, 5, 13, 26, 32*, 33, 39, 41.46*.56*, AND MATLAB 1 IS DUE
4 9/22 - 9/26	» REVIEW FOR EXAM I - 9/24/2014	9 » STUDY FOR EXAM I
COMMON EXAM 1: WEDNESDAY, SEPTEMBER 24, 2014		
	3.3: Differentiation Rules	10 p.144: 5, 7, 19, 25, 31, 38*, 39, 40*, 41, 43, 45
	» GO OVER EXAM 1	
	3.3: Differentiation Rules (cont.)	11 p.144: 47, 52*, 53, 55, 57, 60*, 62, 63, 65, 70*, 72
5 9/29 - 10/3	3.4: The Derivative as a Rate of Change	12 p.153: 1, 5, 7, 10, 13, 17, 18*, 22*, 23, 25, 31

	3.5:	Derivatives of Trigonometric Functions	13	p.160:	2, 12, 15, 16, 19, 26, 29, 33, 35, 44*, 49, 53, 59, 61
	3.6:	The Chain Rule	14	p.168:	3, 5, 17, 23, 25, 29, 33, 35, 39, 43, 46*, 47, 49, 50*, 51, 61, 62*, 63, 65, 66*, 67
6 10/6 – 10/10	3.6, 3.7:	The Chain Rule (cont.) and Implicit Differentiation	15	p.168:	71, 77, 79, 81, 83, 86*, 88*, 89, 95, 99
	3.7, 3.8:	Implicit Differentiation (cont.) and Derivatives of Inverse Functions and Logarithms	16	p.175:	1, 7, 11, 15, 16, 17, 19, 23, 26*, 31, 37, 38*, 39
	3.8:	Derivatives of Inverse Functions and Logarithms (cont.)	17	p.185:	7, 9, 13, 21, 24, 29, 31, 35, 36*, 39, 43, 56*, 61, 63, 65, 69, 74*, 83, 89, 92*, 95
7 10/13 – 10/17	3.9:	Inverse Trigonometric Functions	18	p.192:	5, 11, 21, 23, 31, 33, 34, 36*, 37, 41, 42*, 61
	3.10:	Related Rates	19	p.198:	7, 11, 15, 17, 21, 23, 25, 26*
	3.10, 3.11:	Related Rates (cont.) and Linearization and Differentials	20	p.198:	27, 31, 32*, 33, 37, 40, 41, 42*
8 10/20 – 10/24	»	REVIEW FOR EXAM II ~ 10/22/2014	21	»	STUDY FOR EXAM II
COMMON EXAM 2: WEDNESDAY, OCTOBER 22, 2014					
	3.11, 4.1:	Linearization and Differentials (cont.) and Extreme Values of Functions	22	p.211:	5, 11, 13, 18*, 19, 31, 35, 41, 51, 53, 54*, 59
	»	GO OVER EXAM 2			
	4.1:	Extreme Values of Functions (cont.)	23	p.228:	7, 25, 29, 33, 35, 39, 41, 47, 49, 51, 61, 63, 65, 67, 69, 71, 72*, 86
9 10/27 – 10/31	4.2:	The Mean Value Theorem	24	p.237:	3, 4, 5, 6, 11, 13, 16, 21, 24*
	4.2, 4.3:	The Mean Value Theorem (cont.) and Monotone Functions and the First Derivative Test	25	p.237:	31, 35, 37, 41, 45, 47, 49, 51, 56, 63*
	4.3, 4.4:	Monotone Functions and the First Derivative Test (cont.) and Concavity and Curve Sketching	26	p.242:	11, 13, 21, 29, 36*, 37, 40*, 41, 43, 49, 61, 71, 73
10 11/3 - 11/7	• November 3, 2014: (M) LAST DAY TO WITHDRAW FROM THIS COURSE				

	4.4:	Concavity and Curve Sketching (cont.)	27	p.252:	7, 13, 19, 25, 28, 31, 35, 39, 43, 45, 49, 58*, 90*, 94*, 99, 111, 121
	4.5:	Indeterminate Forms and L'Hopital's Rule	28	p.262:	7, 9, 11, 15, 19, 21, 23, 29, 33, 37, 40*, 41, 44, 46, 48*, 49
	4.5, 4.6:	Indeterminate Forms and L'Hopital's Rule (cont.) Applied Optimization	29	p.262:	51, 55, 57, 58, 60*, 63, 65, 67, 71, 79, 82*
11 11/10 – 11/14	4.6:	Applied Optimization (cont.)	30	p.270:	4, 7, 9, 11, 12, 14, 23, 24*, 30*, 31, 38, 39, 51, 56
	»	MATLAB 2		»	DUE ON 11/21/14
	4.7:	Newton's Method	31	p.279:	1, 2, 5, 6*, 12*, 19
	4.8:	Antiderivatives	32	p.287:	5, 11, 19, 35, 37, 39, 41, 45, 47, 54*, 59, 61, 64*, 69, 97, 101, 104, 107, 113, 122*, 123
12 11/17 – 11/21	»	REVIEW FOR EXAM III ~ 11/19/2014	33	»	STUDY FOR EXAM III
COMMON EXAM 3: WEDNESDAY, NOVEMBER 19, 2014					
	5.1:	Area and Estimating with Finite Sums	34	p.307:	1, 5, 7*, 8, 9, 11
	»	GO OVER EXAM 3			
	5.2:	Sigma Notation and Limits of Finite Sums	35	p.315:	7, 9, 17, 25, 29, 33, 38, 39, 40*, 43, 46*, AND MATLAB 2 IS DUE
13 11/24 – 11/26	5.3:	The Definite Integral	36	p.324:	1, 9, 13, 21, 22, 28*, 33, 42, 45
	5.3, 5.4	The Definite Integral (cont.) and The Fundamental Theorem of Calculus	37	p.324:	57, 59, 61, 71, 73*, 74*, 79, 88
• November 25-26, 2014: (T-W) Classes Follow a Thursday & Friday Schedule					
• November 27-28, 2014: (R, F) Thanksgiving ~ No Classes Scheduled					
14 12/1 – 12/5	5.4:	The Fundamental Theorem of Calculus (cont.)	38	p.336:	7, 9, 13, 15, 16*, 21, 23, 27, 30, 41, 47, 50*, 53, 55, 57, 60, 61, 63, 64*, 75, 77
	5.5:	Indefinite Integrals and the Substitution Method	39	p.345:	11, 15, 18, 20, 21, 23, 25, 26, 27, 29, 32*, 33, 36*
	5.5, 5.6	Indefinite Integrals and the Substitution Method (cont.) and Substitution and Area Between Curves	40	p.345:	37, 38*, 43, 46*, 47, 52*, 53, 55, 56*, 59, 63, 65, 79

15 12/8 – 12/10	5.6:	Substitution and Area Between Curves (cont.)	41	p.353:	3, 11, 17, 19, 24*, 27, 29, 33, 39, 51, 64, 69, 72*, 75, 81, 85, 88*, 91, 95, 96*, 97, 100, 113
	»	REVIEW FOR FINAL EXAM	42	»	STUDY FOR FINAL EXAM
FINALS	FINAL EXAM WEEK: DECEMBER 15-19, 2014				
