NJIT New Jersey's Science & Technology University

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 111: Calculus I
Fall 2016 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 I. Cohanoschi
Math 111-003	Professor J. Zaleski
Math 111-005	Professor K. Sullivan
Math 111-007	Professor J. H. Ro
Math 111-009	Professor J. Zaleski
Math 111-011	Professor A. deStefan
Math 111-013	Professor N. Khosla
Math 111-015	Professor M. Michal
Math 111-017	Professor J. H. Ro
Math 111-019	Professor B. Patiak
Math 111-021	Professor P. Sood
Math 111-025	Professor P. Sood
Math 111-027	Professor M. Pedneault
Math 111-029	Professor D. Schmidt
Math 111-101	Professor J. Hayes

Office Hours for All Math Instructors: Fall 2016 Office Hours and Emails

Required Textbook:

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

University-wide Withdrawal Date:The last day to withdraw with a **W** is **Monday, November 7, 2016**. 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:

Quizzes	7%
Online Homework	8%
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.

A	90 - 100	**C**	70 - 74
B+	85 - 89	**D**	60 - 69
B	80 - 84	**F**	0 - 59
C+	75 - 79		

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. Students are expected to attend class. Each class is a learning experience that cannot be replicated through simply "getting the notes."

Homework Policy: 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.

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 will be given approximately once a week throughout the semester. They will be based on the lecture, homework and the in-class discussions. There will be 8-12 assessments given throughout the semester.

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

Common Midterm Exam I	September 28, 2016
Common Midterm Exam II	October 26, 2016
Common Midterm Exam III	November 30, 2016
Final Exam Period	December 16 - 22, 2016

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.

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 Cullimore, Room 214 (See: Fall 2016 Hours)

Accommodation of Disabilities: Disability Support Services (DSS) 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 contact Chantonette Lyles, Associate Director of Disability Support

Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Disability Support Services (DSS) website at:

- http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates (See: Fall 2016 Academic Calendar, Registrar)

Date	Day	Event
September 6, 2016	T	First Day of Classes
September 12, 2016	M	Last Day to Add/Drop Classes
November 7, 2016	M	Last Day to Withdraw
November 22, 2016	T	Thursday Classes Meet
November 23, 2016	W	Friday Classes Meet
November 24 - 27, 2016	R - Su	Thanksgiving Holiday, University Closed
December 14, 2016	W	Last Day of Classes
December 15, 2016	R	Reading Day
December 16 - 22, 2016	F - R	Final Exam Period

Course Outline

Lecture	Section	Topic	Assignment in MyMathLab	Assignment to Hand-in
1	2.1	Rates pf Change and tangents to Curves	1,3,5,9,13,21	
2	2.2	Limit of a Function and Limit Laws	1,13,19,22,25,31,33,35,41, 47,49,53,57,63,79,81	Section 2.2 #s: 3 (also write the function f(x) that is graphed here), 32, 80
3	2.4	One Sided Limits	3,5,9,13,15,17,25,27,29,35,39	
4	2.5	Continuity	3,5,7,15,17,19,21,25,27,29	
MATLAB #1 IS ASSIGNED: DUE ON SEPTEMBER 30TH				
5	2.5/2.6	Continue Continuity; Start Infinite limits	Section 2.5: 33,35,37,39, 41,43,47,53, 55,59	
6	2.6	Limits Involving Infinity; Asymptotes	9,11,23,25,27,31,33,43,45,49, 53,81	Section 2.6: #s 63, 67, 73, 74, 75, 103, 104 Practice Exercises (Page 118): #s 1, 2
7	3.1	Tangents and Derivatives at a Point	11,13,15,17,21,35	
8	3.2	The Derivative as a Function	No online homework	Section 3.2 #s (you must find derivatives using the definition of the derivative): 1, 3, 5, 13, 27, 28, 29, 30, 32, 33, 41, 46, 56
9		**REVIEW FOR EXAM #1**		

10	3.3	Differentiation Rules	3,5,7,17,19,25,31,33,35,39, 41,43,45	
11	3.3	Differentiation Rules	53,55,57,61,63,65	Section 3.3 #s: 47, 60, 70, 72 **MATLAB #1 IS DUE**
12	3.4	Derivatives as a Rate of Change	1,5,7,10,13,17,18,23,25,31	
13	3.5	Derivatives of Trig Functions	2,12,15,16,19,26,29,33,49, 53,59,61	Section 3.5 #s: 35, 44
14	3.6	The Chain Rule	17,23,25,29,35,39,43,47,49, 51,65	
15	3.6/3.7	Continue Chain Rule and start Implicit Differentiation	Section 3.6: 71,77,79,81,83, 89,95,99	
16	3.7/3.8	Continue Implicit Differentiation and start Derivatives of Inverses and Logs	Section 3.7: 1,7,11,15,17,19, 23,31,37,39,47	
17	3.8	Continue Derivatives of Inverse and Log Functions	7,9,13,19,21,24,29,31,35,39, 43,57,61,63,65,69,83,89,93,95	
18	3.9	Inverse Trig Functions	3,5,11,21,23,25,33,34,35,41,47	
19	3.10	Related Rates	7,11,15,17,20,21,23,25	
20	3.10	Related Rates	27,31,32,33,37,40,41	
21		**REVIEW FOR EXAM #2**		
22	3.11	Linearization and Differentials	5,11,13,19,31,35,41,51,53,59	Section 3.11 #s: 18, 54, 65ab
23	4.1	Extreme Values of Functions	25,29,33,39,47,49,51,61,63, 65,67,86	Section 4.1 #s: 15,17,18,20,69,71
24	4.2	The Mean Value Theorem	3,4,6,11,13,16,21,31,35,37,41,51	
25	4.3	Monotone Functions and the First Derivative Test	1,11,21,29,37,43,49,71,73	
26	4.4	Concavity and Curve Sketching	No online homework	Section 4.4 #s: 9,13,19,25,28,31,35,39, 43,52,58,90,94,99,121
27	4.4 /4.5	Continue Curve Sketching	No online homework	Continue above assignment
28	4.5	Indeterminate Forms & L'Hopitals Rule	7,9,11,15,19,21,23,29,33,37, 41,44,46,49	
29	4.5/5.6	Finish L'Hopitals; Start Applied Optimization	Section 4.5: 51,55,57,58,63, 65,67,71,79	
30	4.6	Applied Optimization	4,7,9,11,12,14,23,24,29,31, 38,39,51,56	
31	4.7	Newton's Method	1,2,4,5,19	
MATLAB #2 IS ASSIGNED: DUE DECEMBER 2ND				
32	4.8	Antiderivatives	5,11,19,35,37,39,41,45,47,59, 61,69,97,101,104,107,113,123	
33	5.1	Area and Estimating with	No online homework	Section 5.1 #s: 1-7 odd (for each

		Finite Sums		of these problems, sketch the curve and the rectangles). Also #11
34	5.2	Sigma Notation and Limits of Finite Sums	7,9,17,25,29,33,38,39,40*,43,46*	Section 5.2 #s: 33,39,40,43,45
35		**REVIEW FOR EXAM #3**		
36	5.3	Definite Integral	1,9,13,21,22,33,42,45,47,49	
37	5.3/5.4	Continue Definite Integrals & Start Fundamental Thm of Calculus	Section 5.3: 57,59,61,71,79,88	**MATLAB #2 IS DUE**
38	5.4	Fundamental Theorem of Calculus	7,9,13,15,16*,21,23,27,30,41, 47,50*,53,55, 57,60,61,63,64*,75,77	
39	5.5	Indefinite Integrals and Substitution Method	11,15,18,20,21,23,25,26,27,29,33	
40	5.5	Indefinite Integrals and Substitution Method	No online homework	Section 5.5 #s: 36,37,38,43,46,47,52,53,55, 56,59,63,65,79
41	5.6	Area Between Curves	3,11,17,19,27,29,33,39,51,64, 69,75,81,85,91,95,97,100,113	
42		**CATCH UP AND REVIEW**		
		FINAL EXAM		