MATH 111-W01: Calculus I
Winter 2019 - 2020 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, continuity, differentiation, optimization, approximation, and integration. Applications are drawn from engineering, physics, biology, economics, and design. Effective From: Fall 2014.

Number of Credits: 4

Prerequisites: Math 110 with a grade of C or better or by placement.

Course-Section and Instructors

Course-Section	Instructor
Math 111-W01	Professor M. Potocki-Dul

Days, Times, and Locations:

Days	Times	Locations
M, T, W, R, F	9:00AM - 11:45AM	CKB 223
M, T, W, R, F	12:45PM - 3:15PM	CKB 223

Required Textbook:

Title	*Thomas' Calculus: Early Transcendentals*
Author	Hass, Heil, and Weir
Edition	14th
Publisher	Pearson
ISBN #	978-0134768496
Notes	w/ MyMathLab

University-wide Withdrawal Date: Please note that the last day to withdraw with a W is Wednesday, January 8, 2020. 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	20%
Midterm Exam	35%
Final Exam	45%

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

A	88 - 100	C	65 - 71
B+	83 - 87	D	60 - 64
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.

Homework: The homework assignments are listed in the syllabus and the instructor will tell you when to submit each problem set. **NOTE**: Homework assignments are **DUE** daily at the dates and times specified by the instructor.

Quiz Policy: Quizzes are given in class on a daily basis. 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 one midterm exam held in class during the semester and one comprehensive final exam. Exams are held on the following days:

Midterm Exam	January 6, 2020
Final Exam	January 17, 2020

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 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

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.

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Important Dates (See: Winter 2019-20 Academic Calendar, Registrar)

Date	Day	Event
December 26, 2019	R	Winter Session Classes Begin
December 28, 2019	Sa	Last Day to Add/ Drop
Dec. 31, 2019 & Jan. 1, 2020	T & W	No Classes/ University Closed
January 8, 2020	W	Last Day to Withdraw
January 17, 2020	F	Last Day of Winter Session/ Final Exams

Course Outline

Lecture	Section	Topic	Textbook Assignment	Hand-in Assignment
DAY 1	2.1	Rates of Change and tangents to Curves	1, 5, 9, 13, 25	3
	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	32, 50, 80
	2.4	One Sided Limits	3, 5, 9, 13, 15, 17, 27, 29, 31, 37,41	32, 34, 49
DAY 2	2.5	Continuity	3, 5, 7, 15, 17, 21, 25, 27, 29, 35, 37, 39, 41, 43,	18, 30, 32,

			45, 49, 55, 61	40, 56, 57
	2.6	Limits Involving Infinity; Asymptotes	7, 9, 11, 23, 25, 27, 31, 33, 43,45, 49, 53, 63, 67, 89, 91, 105	30, 79, 80, 109
	3.1	Tangents and Derivatives at a Point	11, 13, 15, 17, 21, 35	34
DAY 3	3.2	The Derivative as a Function	1, 3.5, 13, 26, 33, 39, 41	32, 48, 58
	3.3	Differentiation Rules	5, 7, 19, 25, 31, 39, 41, 43, 45, 47, 53, 55, 57, 59, 62, 63, 74	38, 40, 52, 60, 72
	3.4	Derivatives as a Rate of Change	1, 5, 7,10,13,17, 23, 25,31	18, 22
DAY 4	3.5	Derivatives of Trig Functions	2, 12, 15, 16, 19, 26, 29, 33, 35,51, 55, 61, 63	46, 60
	3.6	The Chain Rule	5, 17, 23, 25, 29, 33, 35, 39, 43,47, 49, 51, 61, 63, 65, 67, 71, 77, 81, 83, 85, 89, 97, 101	46, 50, 62, 66, 88, 90
	3.7	Implicit Differentiation	1, 7, 11, 15, 16, 17, 19, 23, 33, 39, 41	26, 40
DAY 5	3.8	Derivatives of Inverse and Log Functions	7, 9, 13, 21, 24, 29, 31, 35, 39,43, 57, 61, 63, 65, 69, 83, 89, 95	36, 74, 92, 98
	3.9	Inverse Trig Functions	5, 11, 21, 23, 31, 33, 34, 37, 41,65	36, 42, 44
DAY 6	3.1	Related Rates	7, 11, 15, 17, 21, 23, 25, 27, 31, 33, 37, 40, 41	26, 32, 42
	3.11	Linearization and Differentials	5, 11,13, 19, 31, 35, 41, 51, 53, 59	18, 54
DAY 7		REVIEW FOR MIDTERM EXAM		
		MIDTERM EXAM		
DAY 8	4.1	Extreme Values of Functions	7, 25, 29, 33, 35, 39, 41, 47, 49,51, 57, 59, 78	54, 60
	4.2	The Mean Value Theorem	3, 4, 5, 6, 11, 13, 16, 21, 31, 35, 37, 41, 45, 47, 49, 51, 56	24, 63
DAY 9	4.3	Monotone Functions and the First Derivative Test	11, 13, 21, 29, 37, 41, 43, 51, 63, 75, 77	36, 40
	4.4	Concavity and Curve Sketching	7, 13, 19, 25, 28, 31, 35, 39, 43,45, 99, 117, 127	52, 58, 90, 94
DAY 10	4.5	Indeterminate Forms and L'Hopitals Rule	7, 9, 11, 15, 19, 21, 23, 29, 33,37,41,44, 46, 49, 51, 55, 57, 58, 63,65, 67, 71, 79	40, 48, 60, 82
	4.6	Applied Optimization	4, 7, 9, 11, 12, 14, 23, 29, 44, 45,57, 62	24, 30
DAY 11	4.7	Newton's Method	1, 2, 5, 23	6, 16
	4.8	Antiderivatives	5, 11, 19, 35, 37, 39, 41, 45, 47,54, 59, 61, 69, 97, 101, 104, 107,113, 100	64, 126
	5.1	Area and Estimating with Finite Sums	1, 5, 8, 9, 11	7
DAY 12	5.2	Sigma Notation and Limits of Finite Sums	7, 9, 17, 25, 29, 37, 42, 43, 47	44, 50
	5.3	Definite Integrals	1, 9, 13, 21, 22, 33, 42, 45, 57, 59, 61, 71, 79, 88	28, 73,74
	5.4	Fundamental Theorem of Calculus	7, 9, 13, 15, 21, 23, 27, 30, 41,47, 53, 55, 57, 60, 61, 63, 77, 79	16, 50, 64

DAY 13	5.5	Indefinite Integrals and Substitution Method	11, 15, 18, 20, 21, 23, 25, 26, 27,29, 33, 37, 43, 47, 53, 55, 59, 63, 65, 79	32, 36, 38, 46, 52, 56
DAY 14	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, 115	24, 74, 90
		REVIEW FOR FINAL EXAM		
DAY 15		FINAL EXAM		