

MATH 309: Mathematical Analysis for Technology *Fall 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: Emphasis on partial derivatives; vector calculus, and multiple integrals.

Number of Credits: 4

Prerequisites: **MATH 112** with a grade of C or better, or **MATH 133** with a grade of C or better or **MATH 238** with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Math 309-001	Professor K. Horwitz
Math 309-101	Professor K. Horwitz

Office Hours for All Math Instructors: [Fall 2020 Office Hours and Emails](#)

Required Textbook:

Title	<i>Calculus: Concepts and Contexts</i>
Author	Stewart
Edition	4th
Publisher	Cengage
ISBN #	978-0495557425

Supplementary Text:

Active Calculus-Multivariable, Schlicker, 2018.

ISBN: 978-1724366856

<https://activecalculus.org/ACM.html>

<https://activecalculus.org/multi/>

<https://activecalculus.org/>

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 9, 2020**. It will be strictly enforced.

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%
Projects	5%
Midterm Exam I	15%
Midterm Exam II	15%
Midterm Exam III	15%
Final Exam	30%

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

A	90 - 100	C	65 - 74
B+	85 - 89	D	55 - 64
B	80 - 84	F	0 - 54
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 an expectation of the course. The problems listed in the syllabus are to be handed in through Canvas. There will be additional homework on WebAssign is expected to be completed by the deadlines set forth in the web portal. If you have any difficulties with registering and getting an account with web assign please see the professor immediately. Late homework will be assessed at a 50% penalty.

Quiz Policy: There will be approximately 8 quizzes given throughout the semester. They will be based on the lecture, homework and the in-class discussions.

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

Midterm Exam I	Week 4
Midterm Exam II	Week 9
Midterm Exam III	Week 11
Final Exam Period	December 15 - 21, 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 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.

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 2020 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**.

All students must familiarize themselves with and adhere to the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. The Department of Mathematical Sciences takes these policies very seriously and enforces them strictly.

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 Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

- <https://www.njit.edu/studentsuccess/accessibility/>

Important Dates (See: **Fall 2020 Academic Calendar, Registrar**)

Date	Day	Event
September 1, 2020	T	First Day of Classes
September 5, 2020	S	Saturday Classes Begin
September 7, 2020	M	Labor Day
September 8, 2020	T	Monday Classes Meet
September 8, 2020	T	Last Day to Add/Drop Classes
November 9, 2020	M	Last Day to Withdraw
November 25, 2020	W	Friday Classes Meet
November 26-29, 2020	R - Su	Thanksgiving Recess - University Closed
December 10, 2020	R	Last Day of Classes
December 11 & 14, 2020	F & M	Reading Days
December 15 - 21, 2020	T - M	Final Exam Period

Course Outline

Week	Section and Topic		Lecture and Homework Assignments	
1	9.1:	Three Dimensional Coordinate Systems	1	11, 12, 13, 17, 19, 20, 22, 23, 26, 28, 33
	9.2:	Vectors	1	5, 7, 9, 11, 12, 15, 17, 19, 20
	9.3:	The Dot Product	2	2, 3, 4, 5, 9, 15, 16, 17, 19, 20, 21, 22, 29, 32
2	9.4:	The Cross Product	3	7, 8, 9, 10, 11, 19, 21, 27, 28, 29
	1.7:	Vector Functions and Space Curves	4	1, 3, 5, 7, 13, 15, 19
	10.1:		1, 3, 5, 7, 9, 15, 17	
9.5:	3, 4, 6, 7, 11, 17, 19, 53			
3	3.4:	Derivatives of Vector Functions	5	79, 81, 83
	10.2:		9, 11, 13, 15, 17, 23	
	6.1:	Integrals of Vector Functions	5	35
	10.2:		33, 35, 37, 39	
4		<i>Review for Examination 1</i>		Study for Examination 1
		EXAMINATION 1		
5	6.4:	Arc Length and Curvature	7	7, 13, 16
	10.3:		1, 2, 3, 17, 21, 22, 23, 27, 41, 43	
	9.5:	Functions of Several Variables	8	23, 27, 29, 33, 39, 43, 55, 56
9.6:	5, 6, 7, 8, 16, 17, 18, 19, 20, 21, 22			
11.1:	5, 6, 7, 8, 9, 11, 15, 17			
6	9.7:	Polar and Cylindrical Coordinates	9	3, 5, 7, 9, 11, 12, 15, 17, 19, 21(a), 25
	H.1:		1, 3, 5, 9, 11, 13, 15, 17, 18, 25, 29, 49, 51	
	H.2:		3, 5, 7, 15, 31, 35, 36	
6	11.3:	Partial Derivatives and Tangent Planes	10	15, 16, 17, 18, 19, 25, 26, 29, 30, 31, 39, 46, 56
	11.4:		1, 2, 3, 5, 11, 12, 15, 21	
7	11.5:	Chain Rule	11	1, 2, 3, 5, 7, 9, 10, 11, 21, 22, 26, 28
	11.6:	Directional Derivatives and the Gradient Vector	12	5, 6, 7, 9, 11, 12, 15, 21
	11.7:	Maximum and Minimum Values	13	5, 7, 9, 10, 11, 27, 29 GRADIENT PROJECT
		<i>Review for Examination 2</i>		Study for Examination 2
9		EXAMINATION 2		
9	12.1:	Double Integration over Rectangles	14	11, 12, 13
	12.2:		3, 5, 7, 8, 12, 16, 17, 27	
10	12.3:	Double Integrals over General Regions	15	1, 3, 4, 5, 7, 9, 10, 17, 20, 41, 47, 48
	12.4:	Double Integrals in Polar Coordinates	16	7, 9, 11, 15, 27

11	12.7:	Triple Integrals	20	3, 4, 5, 9, 11, 19
		EXAMINATION 3		
12	13.1:	Vector Fields and Line Integrals	21	1, 3, 21, 24 LINE INTEGRALS PROJECT
	13.2:			1, 3, 5, 7, 19, 20
13	13.3:	The Fundamental Theorem for Line Integrals	23	3, 5, 12, 13, 14
	13.4:	Green's Theorem	23	1, 3, 5, 7, 9
14		<i>Review for Final Examination</i>		
FINALS				

*Updated by Professor K. Horwitz - 8/20/2020
Department of Mathematical Sciences Course Syllabus, Fall 2020*
