

## **MATH 309: Mathematical Analysis for Technology** *Fall 2021 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.

“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu)”

### **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:**

<b>Course-Section</b>	<b>Instructor</b>
Math 309-001	Professor I. Cohanoschi

**Office Hours for All Math Instructors:** [Fall 2021 Office Hours and Emails](#)

**Required Textbook:**

<b>Title</b>	<i>Calculus: Concepts and Contexts</i>
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Author	Stewart
Edition	4th
Publisher	Cengage
ISBN #	978-1337877367 (WebAssign w/ e-book)
Notes	Laptop Computer

**University-wide Withdrawal Date:** The last day to withdraw with a **W** is **Wednesday, November 10, 2021**. 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	15%
Quizzes	10%
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:** Homework is an expectation of the course. All homework assignments are online using WebAssign. The online assignments can be completed at [www.webassign.net](http://www.webassign.net). You need to have a student access code. Access codes are included with a new book that is bundled with WebAssign; codes can be purchased separately from the bookstore or online. WebAssign gives you free access for two weeks after the start of class. In addition, on the first day of class your course instructor will give an additional code "Class key" needed to

enroll to WebAssign.

**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 are no make-up quizzes; average will be calculated after dropping the lowest score.

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

Midterm Exam I	Week 4
Midterm Exam II	Week 8
Midterm Exam III	Week 11
Final Exam Period	December 15 - 21, 2021

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 2021 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 are in need of accommodations due to a disability please contact Scott Janz, Associate Director of Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at [scott.p.janz@njit.edu](mailto:scott.p.janz@njit.edu). The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and 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 Office of Accessibility Resources and Services (OARS) website at:

<https://www.njit.edu/studentssuccess/accessibility/>

**Important Dates** (See: [Fall 2021 Academic Calendar, Registrar](#))

Date	Day	Event
September 1, 2021	Wednesday	First Day of Classes
September 4, 2021	Saturday	Saturday Classes Begin
September 6, 2021	Monday	Labor Day
September 8, 2021	Wednesday	Monday Classes Meet
September 8, 2021	Wednesday	Last Day to Add/Drop Classes
November 10, 2021	Wednesday	Last Day to Withdraw
November 25 to November 28, 2021	Thursday to Sunday	Thanksgiving Recess - Closed
December 10, 2021	Friday	Last Day of Classes
December 13 and December 14, 2021	Monday and Tuesday	Reading Days
December 15 to December 21, 2021	Wednesday to Tuesday	Final Exam Period

## Course Outline

Week	Section and Topic		Lecture and Homework Assignments	
1	9.1	Three Dimensional Coordinates	1	7,8,10,11,12
	9.2	Vectors	2	7,11,13,15,16,17,19,24
	9.3	The Dot Product	3	9.3.1,3,4,10,15,16,29
2	9.4	The Cross Product	4	9.4.7,8,19,20
	9.5	Equations of Lines	5	2,3,19
	1.7	Parametric Curves	6	5,22,31
3	10.1	Vector Functions	7	1,2,4,5,15
	10.2	Derivatives/Integrals of Vector Functions	8	9,11,12,15,33,34,35
	6.1	Parametric Integrals	9	34,34SA
4	3.4	Tangents to Parametric Curves	10	33,79
		<b>Review for Examination 1 Examination 1</b>	11 12	<b>Study for Examination 1</b>
5	6.4	Arc Length	13	1,7,16
	10.3	Arc Length and Curvature	14	1,3,17,23,25
	9.5	Equations of Planes	15	14,23

6	11.1	Functions of Several Variables	16	5,12,15,16,18,19
	9.7	Cylindrical and Spherical Coordinates	17	3,25
	11.3	Partial Derivatives	18	15,16,17,18,21,39,51,54
7	11.4	Tangent Planes	19	2,3,5
	11.5	The Chain Rule	20	2,3,5,7,9,21,22
	11.6	Directional Derivatives and the Gradient Vector	21	
8	11.7	Maximum and Minimum Values	22	7,9,11,39,42
		<b>Review for Examination 2</b>	23	<b>Study for Examination 2</b>
		<b>Examination 2</b>	24	
9	12.1	Double Integrals over Rectangles	25	1,11,12
	12.2	Iterated Integrals	26	3,4,5,15
	12.3	Double Integrals over General Regions	27	1,5,6,7,8,17,47,50
10	12.4	Double Integrals in Polar Coordinates	28	15
	12.7	Triple Integrals	29	3,6,11,13
11	13.1	Vector Fields	30	11,21,33
		<b>Review for Examination 3</b>	31	<b>Study for Examination 3</b>
		<b>Examination 3</b>	32	
12	13.2	Line Integrals	33	L15.2.8,14,30,60
	13.2		34	
13	13.3	The Fundamental Theorem for Line Integrals	35	3,12,13,14,17
	13.4:	Green's Theorem	36	1,4,5,6
	13.4		37	
14		Catch-Up	38	
		Catch-Up	39	
		<b>REVIEW FOR FINAL EXAMINATION</b>	40	
<b>FINALS</b>				

*Updated by Professor I. Cohanoschi - 8/16/2021  
Department of Mathematical Sciences Course Syllabus, Fall 2021*