

## MATH 309: Mathematical Analysis for Technology

### *Spring 2022 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.

Please be sure you read and fully understand our [DMS Online Exam Policy](#).

### 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 309-002	Professor K. Horwitz
Math 309-102	Professor K. Horwitz

**Office Hours for All Math Instructors:** [Spring 2022 Office Hours and Emails](#)

**Required Textbook:**

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

**University-wide Withdrawal Date:** The last day to withdraw with a W is [Monday, April 4, 2022](#). 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:

Exam 1	15%
Exam 2	15%
Exam 3	15%
Homework	10%
Quizzes	10%
Projects	5%
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.

**Homework:** 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 that 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 WebAssign please see the professor immediately. Late homework will be assessed at a 50% penalty.

**Quizzes:** 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 two exams and a final. The exams will be at week 4 and week 9 of the course, and the final will be announced by the University. Each exam will test the material taught since the beginning of the semester.

Midterm Exam I	Week 4
Midterm Exam II	Week 9
Final Exam Period	May 6 - May 12, 2022

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: [Spring 2022 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/studentsuccess/accessibility/>

**Important Dates** (See: [Spring 2022 Academic Calendar, Registrar](#))

Date	Day	Event
January 18, 2022	Tuesday	First Day of Classes
January 22, 2022	Saturday	Saturday Classes Begin
January 24, 2022	Monday	Last Day to Add/Drop Classes
March 14, 2022	Monday	Spring Recess Begins
March 19, 2022	Saturday	Spring Recess Ends
April 4, 2022	Monday	Last Day to Withdraw
April 15, 2022	Friday	Good Friday - No Classes

April 17, 2022	Sunday	Easter Sunday - No Classes
May 3, 2022	Tuesday	Friday Classes Meet
May 3, 2022	Tuesday	Last Day of Classes
May 4 - May 5, 2022	Wednesday and Thursday	Reading Days
May 6 - May 12, 2022	Friday to Thursday	Final Exam Period

## Course Outline

Week	Section & 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: 10.1: 9.5:	Vector Functions and Space Curves	4	1,3,5,7, 13,15, 19 1,3,5,7,9,15,17 3,4,6,7, 11,17,19, 53
3	3.4: 10.2:	Derivatives of Vector Functions	5	79,81,83 9,11,13,15,17,23
	6.1: 10.2:	Integrals of Vector Functions	5	35 33,35,37,39
4		Review for Examination 1		Study for Examination 1
		Examination 1		
5	6.4: 10.3:	Arc Length and Curvature	7	7,13,16 1,2,3,17,21,22,23,27,41,43
	9.5: 9.6: 11.1:	Functions of Several Variables	8	23,27,29,33,39,43,55,56 5,6,7,8,16,17,18,19,20,21,22 5,6,7,8,9,11,15,17
6	9.7: H.1: H.2:	Polar and Cylindrical Coordinates	9	3,5,7,9,11,12,15,17,19,21(a),25 1,3,5,9,11,13,15,17,18,25,29,49,51 3,5,7,15,31,35,36
	11.3: 11.4:	Partial Derivatives and Tangent Planes	10	15,16,17,18,19,25,26,29,30,31,39,46 ,56 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
8	11.7:	Maximum and Minimum Values	13	5,7,9,10,11,27,29
		Review for Examination 2		Study for Examination 2
9		Examination 2		
	12.1: 12.2:	Double Integration over Rectangles	14	11,12,13 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: 13.2:	Vector Fields and Line Integrals	21	1,3,21,24 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		Review for Final Examination		
Final	May 6 - May 12, 2022			

*Updated by Professor K. Horwitz - 1/7/2022  
Department of Mathematical Sciences Course Syllabus, Spring 2022*