MATH 309: Mathematical Analysis for Technology
Spring 2023 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 2023 Office Hours and Emails

Required Textbook:

Title	*Calculus: Concepts and Contexts*
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 3, 2023**. 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.

Exams: There will be three exams during the semester and a final exam during the final exam week:

Exam I	Week 4
Exam II	Week 9
Exam III	Week 11
Final Exam Period	May 5 - May 11, 2023

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 2023 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 or via email at 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/accessibility/

Important Dates (See: Spring 2023 Academic Calendar, Registrar)

Date	Day	Event
January 17, 2023	Tuesday	First Day of Classes
January 23, 2023	Monday	Last Day to Add/Drop Classes
March 13, 2023	Monday	Spring Recess Begins
March 18, 2023	Saturday	Spring Recess Ends
April 3, 2023	Monday	Last Day to Withdraw
April 7, 2023	Friday	Good Friday - No Classes
May 2, 2023	Tuesday	Friday Classes Meet
May 2, 2023	Tuesday	Last Day of Classes
May 3 - May 4, 2023	Wednesday and Thursday	Reading Days

May 5 - May 11, 2023	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 5 - May 11, 2023			