New Jersey Institute of Technology

Digital Commons @ NJIT

Fall 2024

MATH 309-101: Math Analysis for Tech

J.H. Ro

Follow this and additional works at: https://digitalcommons.njit.edu/math-syllabi

MATH 309: Mathematical Analysis for Technology
Fall 2024 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 309-101	Professor J. H. Ro

Office Hours for All Math Instructors: Fall 2024 Office Hours and Emails

Required Textbook:

Title	*Calculus: Concepts and Contexts*
Author	Stewart
Edition	5th
Publisher	Cengage Learning
ISBN #	978-0357756911

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 11, 2024**. 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	15%
Final Exam	30%

Your final letter grade will be based on the following tentative curve. **NOTE:** This course needs to be passed with a grade of C or better in order to proceed to Math 322.

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 1	Week 4
Exam 2	Week 9
Exam 3	Week 12
Final Exam Period	December 15 - December 21, 2024

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.

Quizzes: Quizzes will be given approximately once per week. They can be on paper or virtual format. The quizzes will be based on the lecture and homework. All quizzes are cumulative.

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 2024 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 need accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is 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: Fall 2024 Academic Calendar, Registrar)

Date	Day	Event
September 2, 2024	Monday	Labor Day
September 3, 2024	Tuesday	First Day of Classes
September 9, 2024	Monday	Last Day to Add/Drop Classes
November 11, 2024	Monday	Last Day to Withdraw
November 26, 2024	Tuesday	Thursday Classes Meet
November 27, 2024	Wednesday	Friday Classes Meet
November 28 to December 1, 2024	Thursday and Sunday	Thanksgiving Recess - Closed
December 11, 2024	Wednesday	Last Day of Classes
December 12, 2024	Thursday	Reading Day 1
December 13, 2024	Friday	Reading Day 2
December 15 to December 21, 2024	Sunday to Saturday	Final Exam Period

Course Outline

Week	Section & Topic		Lecture and Homework Assignments	
1	**9.1**	Three Dimensional Coordinate Systems	**1**	12, 13, 14, 15, 24, 25, 29, 32
	9.2	Vectors	**1**	5, 7, 9, 11, 12, 15, 17, 19, 20, 21, 23, 25, 27
	9.3	The Dot Product	**2**	2, 3, 4, 5, 9, 13, 20, 21, 23, 25, 33, 43, 45, 48
2	**9.4**	The Cross Product	**3**	7, 8, 9, 10, 11, 24, 27, 29, 34, 35, 38, 39
	9.5 **10.1**	Equations of Lines and Planes Vector Functions and Space Curves	**4** **5**	**9.5** : 3, 4, 6, 7, 14, 23, 24, 31, 38, 69, 71 **10.1** : 1, 6, 10, 23, 24, 25, 26
3	**10.2**	Derivatives of Vector Functions	**6**	11, 13, 15, 19, 21, 23, 29, 30
	10.2	Integrals of Vector Functions	**7**	42, 43, 44, 45, 46, 47, 49
4		Review for Examination 1	**8**	Study for Examination 1
		Examination 1	**9**	
5	**10.3**	Arc Length and Curvature	**10**	1, 2, 3, 4, 17, 19(a), 21(a)
	9.6 **11.1**	Functions of Several Variables	**11**	**9.6** : 6, 8, 9, 19 **11.1** : 7, 8, 9, 10, 23, 24, 27
6	**H.1** **H.2**	Polar and Cylindrical Coordinates	**12**	**H.1** : 1, 3, 5, 9, 11, 13, 15, 17, 25, 29, 49, 51 **H.2** : 3, 5, 7, 15, 31, 35
	11.3 **11.4**	Partial Derivatives and Tangent Planes	**13** **14**	**11.3** : 13, 15, 16, 17, 18, 19, 22, 25, 26, 27, 31, 32, 37, 41, 45, 47, 51, 55, 57, 59, 63, 75, 79 **11.4** : 1, 2, 3, 4, 5, 7, 14, 15, 17, 19
7	**11.5**	Chain Rule	**15**	1, 2, 3, 5, 7, 9, 10, 11, 15, 17, 27, 28, 29, 31
	11.6	Directional Derivatives and the Gradient Vector	**16**	5, 6, 7, 9, 11, 12, 15, 21, 27, 29, 31
8	**11.7**	Maximum and Minimum Values	**17**	5, 7, 9, 10, 11, 27, 29, 37
		Review for Examination 2	**18**	Study for Examination 2
9		Examination 2	**19**	
	12.1 **12.2**	Double Integration over Rectangles	**20**	**12.1** : 13, 14, 15 **12.2** : 1, 3, 5, 7, 8, 12, 16, 17, 19, 21
10	**12.3**	Double Integrals over General Regions	**21**	1, 3, 4, 5, 7, 9, 10, 17, 20, 21, 49, 51, 53, 55, 57
	12.4	Double Integrals in Polar Coordinates	**22**	7, 9, 11, 13, 27, 32, 33
11	**12.7**	Triple Integrals	**23**	3, 4, 5, 9, 11, 19
		Review for Examination 3	**24**	Study for Examination 3
12		Examination 3	**25**	
	13.1 **13.2**	Vector Fields and Line Integrals	**26**	**13.1** : 1, 3, 5, 25, 27, 29 **13.2** : 1, 3, 5, 7, 21, 23

13	**13.3**	The Fundamental Theorem for Line Integrals	27	3, 5, 11, 12
	13.4	Green's Theorem	28	1, 3, 5, 7, 9
14		Review for Final Examination		
Final	December 16 – 22, 2024			

Updated by Professor J. H. Ro - 8/2024
Department of Mathematical Sciences Course Syllabus, Fall 2024