

## MATH 211: Calculus III A

### *Summer 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.

### COURSE INFORMATION

**Course Description:** Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, and Green's theorem. Students who are considering a major in Mathematical Sciences or who are undecided about their major should take MATH 213.

**Number of Credits:** 3

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

**Course-Section and Instructors:**

Course-Section	Instructor
Math 211-141	Professor J. Ratnaswamy

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

**Required Textbook:**

Title	<i>Thomas' Calculus: Early Transcendentals</i>
Author	Thomas
Edition	14th
Publisher	Pearson
ISBN #	978-0134768496 (bound) 9780134768762 (looseleaf)

**University-wide Withdrawal Date:** Please see the [Summer 2022 Academic Calendar](#) for the last day to withdraw based on the summer session you are registered for.

## COURSE GOALS

### Course Objectives

- Apply previously developed skills learned in Calculus to learn Multivariable Calculus and Vectors.
- Cover Vectors, Partial Derivatives, Multiple Integrals and Vector Fields to prepare students for further study in technological disciplines and more advanced mathematics courses.
- Cover relevant applications in science and engineering to illustrate the utility of learning these topics.
- Use mathematical software, in problem solving, to allow the solution of more complex problems and provide visualization of the mathematical concepts in three dimensions.

### Course Outcomes

- Prepare students for further study in technological disciplines and more advanced mathematics courses.
- Illustrate the utility of learning Multivariable Calculus to solve problems in engineering and the sciences.
- Demonstrate mastery of the topics covered by testing with common exams and common grading.

## 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 and Quizzes	25%
Midterm Exam	35%
Final Exam	40%

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

A	90 - 100	C	60 - 66
B+	81 - 89	D	57 - 59
B	74 - 80	F	0 - 56
C+	67 - 73		

**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 and Quiz Policy:** The homework assignments are in the syllabus and online. In order to do the assignments you need to have a student access code. You can get an access code with a new book purchase that is bundled with My MathLab or by buying the code separately at the campus bookstore. If you buy a new book from another source make sure it is bundled with My MathLab. In addition on the first day of class your course instructor will give you an additional code needed to access the homework assignments. A quiz based on the homework problems will be given each week online or in class. There will be a short quiz every week on the material covered during the previous week. All of the quizzes will be graded. The homework and quizzes are

intended to develop your problem-solving skills and to prepare you for the exams. The quiz and homework grades will be a significant component of your course grade.

#### How to Get Started with MyMathLab:

- [http://m.njit.edu/Undergraduate/UG-Files/MML\\_Getting\\_Started.pdf](http://m.njit.edu/Undergraduate/UG-Files/MML_Getting_Started.pdf)
- [http://m.njit.edu/Undergraduate/UG-Files/Technology\\_Tips.pdf](http://m.njit.edu/Undergraduate/UG-Files/Technology_Tips.pdf)

**MATLAB Assignments:** MATLAB is a mathematical software program that is used throughout the science and engineering curricula. Several MATLAB assignments will be given out. These assignments have been designed to help you learn how to use this software in order to visualize many of the concepts taught in class. Each MATLAB assignment will be graded and will be counted as a weekly quiz grade.

**Class Preparation:** Class preparation consists of written summaries of lectures handed in at the beginning of every class (together with homework). Students are responsible to read the section before the lecture and write a one page summary consisting of definitions, theorems, and important examples.

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

Midterm Exam	June 22, 2022
Final Exam	July 19, 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. To properly report your absence from a midterm or final exam, please review and follow the required steps under the DMS Examination Policy found here:

[http://math.njit.edu/students/policies\\_exam.php](http://math.njit.edu/students/policies_exam.php)

**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: [Summer 2022 Hours](#))

**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: [Summer 2022 Academic Calendar](#), Registrar)

<b>Date</b>	<b>Day</b>	<b>Event</b>
May 23, 2022	Monday	<b>Full, First, and Middle</b> Summer Session Begins
May 25, 2022	Wednesday	Last Day to Add/Drop for <b>First Summer</b> Session
May 27, 2022	Friday	Last Day to Add/Drop for <b>Middle Summer</b> Session
May 30, 2022	Monday	Last Day to Add/Drop for <b>Full Summer</b> Session
May 30, 2022	Monday	Memorial Day - University Closed/No Classes Scheduled
June 11, 2022	Saturday	Last Day to Withdraw from <b>First Summer</b> Session
June 17, 2022	Friday	Last Day to Withdraw from <b>Middle Summer</b> Session
June 27, 2022	Monday	Last Day of Classes for <b>First Summer</b> Session
July 1, 2022	Friday	Last Day to Withdraw from <b>Full Summer</b> Session
July 3, 2022	Sunday	Independence Day - University Closed/No Classes Scheduled
July 4, 2022	Monday	Independence Day - Holiday Observance/No Classes
July 5, 2022	Tuesday	Second Summer Session Begins
July 6, 2022	Wednesday	Last Day to Add/Drop for Second Summer Session
July 18, 2022	Monday	Last Day of Classes for Middle Summer Session
July 21, 2022	Thursday	Last Day to Withdraw for Second Summer Session
August 8, 2022	Monday	Last Day of Classes for Full and Second Summer Session

## Course Outline

Lecture #	Section #	Subject Topic	Homework (HW) Assignment
1	12.1 - 12.2	<i>Three-Dimensional Coordinate Systems and Vectors</i>	p.726: 7, 13, 15, 17, 25, 29, 33, 39, 45, 49
2	12.3	<i>The Dot Product</i>	p.734: 3, 7, 11, 13, 16, 26, 29, 30, 43, 45
3	12.4	<i>The Cross Product</i>	p.741: 7, 15, 18, 21, 23, 25, 39, 43, 46, 48
4	12.5	<i>Lines and Planes in Space</i>	p.749: 3, 9, 17, 23, 27, 29, 35, 41, 55, 57, 63
5	12.6 13.1	<i>Cylinders and Quadric Surfaces Curves in Space and Their Tangents</i>	p.755: 7, 9, 11, 14, 19, 23, 33, 41 p.770: 5, 11, 13, 15, 19, 25, 26, 38
6	13.2 13.3	<i>Integrals of Vector Functions; Projectile Motion Arc Length in Space</i>	p.777: 1, 7, 11, 17, 21, 23, 25, 29, 31 p.784: 1, 6, 7, 11, 13, 14, 18
7	14.1 14.3	<i>Functions of Several Variables Partial Derivatives</i>	p.812: 5, 11, 13, 14, 19, 23, 25, 27, 39, 49, 53, 59, 61 p.832: 5, 13, 17, 23, 25, 31, 37, 43, 48, 57, 68, 75, 77, 85, 89, 93
8	14.4	<i>The Chain Rule</i>	p.842: 3, 5, 7, 9, 27, 31, 33, 37, 39, 41, 52
9	14.5	<i>Directional Derivative and Gradient Vectors</i>	p.852: 5, 9, 11, 15, 17, 19, 23, 27, 31, 33, 37, 38
10	REVIEW FOR MIDTERM EXAM		
	MIDTERM EXAM: WEDNESDAY, JUNE 22		
11	14.6	<i>Tangent Planes and Differentials</i>	p.860: 1, 5, 11, 17, 21, 23, 31, 43, 45, 54, 55
12	14.7	<i>Extreme Values and Saddle Points</i>	p.870: 3, 7, 19, 21, 27, 31, 35, 41, 51, 53, 59
13	14.8	<i>Lagrange Multipliers</i>	p.879: 3, 7, 13, 17, 21, 23, 25, 30, 31
14	15.1	<i>Double and Iterated Integrals over Rectangles</i>	p.901: 3, 9, 10, 11, 19, 21, 23, 29, 31
15	15.2 - 15.3	<i>Double Integrals over General Regions and Area by Double Integration</i>	p.909: 7, 13, 15, 35, 39, 43, 49, 51, 53, 57 p.914: 3, 9, 11, 21
16	15.4	<i>Double Integrals in Polar Form</i>	p.919: 7, 11, 13, 17, 23, 25, 29, 37
17	15.5	<i>Triple Integrals in Rectangular Coordinates</i>	p.929: 7, 11, 15, 23, 25, 27, 31, 33
18	15.6	<i>Moments and Center of Mass</i>	p.939: 3, 4, 13
19	15.7	<i>Triple Integrals in Cylindrical Coordinates (ONLY)</i>	p.949: 25, 29, 31, 33, 39, 41, 65, 77, 79, 81
20	16.1	<i>Line Integrals</i>	p.974: 7, 9, 11, 15, 19, 21, 23, 29, 33
21	16.2	<i>Vector Fields and Line Integrals: Work, Circulation, and Flux</i>	p.986: 9, 11, 15, 19, 21, 23, 25, 27, 29, 33

22	16.3	<i>Path Independence, Conservative Fields, and Potential Functions</i>	<i>p.998: 3, 7, 9, 15, 19, 21, 23, 27, 29</i>
23	16.4	<i>Green's Theorem in the Plane</i>	<i>p.998: 3, 7, 9, 15, 19, 21, 23, 27, 29, 29, 31, 32, 34, 39</i>
24	REVIEW FOR THE FINAL EXAM		
25	FINAL EXAM: MONDAY, JULY 19		

*Updated by Professor J. Ratnaswamy - 04/21/2022  
Department of Mathematical Sciences Course Syllabus, Summer 2022*