Fall 2024

MATH 213: Calculus IIIB

Mathematical Science Department

MATH 213: Calculus III B
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: Topics include vectors, curvature, partial derivatives, multiple integrals, line integrals, surface integrals, and Green's, Divergence, and Stokes' theorems. Effective From: Fall 2012.

Number of Credits: 4

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 213-001	Professor V. Barreto-Aranda
Math 213-003	Professor V. Barreto-Aranda
Math 213-005	Professor S. Alptekin
Math 213-007	Professor P. Ward
Math 213-009	Professor P. Ward
Math 213-011	Professor S. Alptekin

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

Required Textbook:

Title	*Thomas' Calculus: Early Transcendentals*
Author	Hass, Heil, and Weir
Edition	15th
Publisher	Pearson

ISBN #	9780137559893 9780137560042

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 11, 2024**. It will be strictly enforced.

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 Participation	10%
In-class Quizzes	20%
Common Midterm Exams (3)	40%
Final Exam	30%

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

A	88 - 100	**C**	65 - 71
B+	83 - 87	**D**	60 - 64
B	77 - 82	**F**	0 - 59
C+	72 - 76		

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 Participation Policy: The homework assignments are 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 MyMathLab 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 MyMathLab.** In addition on the first day of class your course instructor will give you an additional code needed to access the homework assignments.

Quiz Policy: At least one quiz based on the homework problems will be given each week 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 HW+Quiz grades are a significant component of your course grade. (30%)**

How to Get Started with MyMathLab:

http://m.njit.edu/Undergraduate/UG-Files/MML_Getting_Started.pdf
http://m.njit.edu/Undergraduate/UG-Files/Technology_Tips.pdf

Exams: Detailed instructions regarding the Math 213 common midterm exams will be distributed by the course coordinator prior to each exam. There will be three common midterm exams held during the semester and one comprehensive common final exam. Exams are held on the following days:

Common Midterm Exam I	September 25, 2024
Common Midterm Exam II	October 23, 2024
Common Midterm Exam III	November 20, 2024
Final Exam	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.

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 an 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

The placement of Common Exams within the Topic list below is meant to provide a rough estimate of material that will appear on the exam. The precise set of sections to be tested on for each Common Exam will be provided by the course instructor on the Friday preceding the exam.

Sections	Topic
12.1-12.2	Three-Dimensional Coordinate Systems, Vectors
12.3-12.4	The Dot Product, the Cross Product
12.4-12.5	The Cross Product, Lines and Planes in Space
12.5-12.6	Lines and Planes in Space, Cylinders and Quadric Surfaces
12.6	Cylinders and Quadric Surfaces
13.1	Curves in Space and Their Tangents
13.2	Integrals of Vector Functions; Projectile Motion

13.3	Arc Length in Space
	COMMON EXAM 1
13.4	Curvature and Normal Vectors
14.1	Functions of Several Variables
14.2-14.3	Limits and Continuity in higher Dimensions, Partial Derivatives
14.3	Partial Derivatives
14.4-14.5	The Chain Rule, Directional Derivatives and Gradient Vectors
14.5-14.6	Directional Derivative and Gradient Vectors, Tangent Planes and Differentials
14.7	Extreme Values and Saddle Points
14.8	Lagrange Multipliers
14.8-14.9	Lagrange Multipliers, Taylor's Formula in Two Variables
15.1	Double and Iterated Integrals over Rectangles
15.2	Double Integrals over General Regions
15.3	Area by Double Integration
15.4	Double Integrals in Polar Form
	COMMON EXAM 2
15.5	Triple Integrals in Rectangular Coordinates
15.7	Triple Integrals in Cylindrical and Spherical Coordinates
15.7	Triple Integrals in Cylindrical and Spherical Coordinates
15.8	Substitutions in Multiple Integrals
15.8	Substitutions in Multiple Integrals
16.1	Line Integrals
16.1-16.2	Line Integrals, Vector Fields and Line Integrals: Work, Circulation, and Flux
16.2	Vector Fields and Line Integrals: Work, Circulation, and Flux
16.3	Path Independence, Conservative Fields, and Potential Functions
16.3	Path Independence, Conservative Fields, and Potential Functions
16.4	Green's Theorem in the Plane
16.4	Green's Theorem in the Plane
	COMMON EXAM 3
16.5	Surfaces and Area
16.5	Surfaces and Area
16.6	Surface Integrals
16.6	Surface Integrals
16.7	Stokes’ Theorem

16.7	Stokes' Theorem
16.8	The Divergence Theorem
16.8	The Divergence Theorem
	FINAL EXAM REVIEW

Updated by Professor D. Shirokoff - 8/202/2024
Department of Mathematical Sciences Course Syllabus, Fall 2024