

## MATH 546: Advanced Calculus *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.

### COURSE INFORMATION

**Course Description:** Systematic development of partial differentiation, multiple and improper integrals, transformations, inverse and implicit function theorems, and integrals over curves and surfaces.

**Number of Credits:** 3

**Prerequisites:** **Math 545 or 480** with a grade of C or better.

**Course-Section and Instructors:**

Course-Section	Instructor
Math 546-002	Professor B. Hamfeldt

**Office Hours for All Math Instructors:** [Spring 2023 Office Hours and Emails](#)

**Required Textbook:**

Title	<i>Introduction to Real Analysis</i>
Author	Trench
Edition	2013
Publisher	Digital Commons @ Trinity
ISBN #	Digital Version

**University-wide Withdrawal Date:** The last day to withdraw with a **W** is **Monday, April 3, 2023**. It will be strictly enforced.

### COURSE GOALS

**Course Assessment:** Outcomes are assessed through weekly quizzes, four assignments, two midterm exams, a

comprehensive final exam, and an optional oral exam.

## 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:

Assignments	15%
Quizzes	15%
Midterm Exams (2)	40%
Final Exam	30%
Oral Exam (Optional/Bonus)	10%

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

A	90 - 110	C+	76 - 79
B+	86 - 89	C	70 - 75
B	80 - 85	F	0 - 69

**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.

**Lectures:** Class lectures will take place in person and may be recorded. If circumstances prevent classes from occurring in person, class lectures will take place via Webex at the regularly scheduled time.

**Practice Problems:** Each week, practice problems will be posted on Canvas with a suggested completion date. These problems do NOT need to be handed in. However, completing these problems is necessary for succeeding in this class. Some of these problems may appear on quizzes, midterm exams, or the final exam.

**Quizzes:** A brief quiz will be given at the beginning of class each Thursday. Quiz problems will be based upon content taught in class during the previous week, and will be drawn from practice problems posted on Canvas. Solutions will be graded for correctness, completeness, and clarity. Missed quizzes CANNOT be made up. However, the lowest two (2) quiz scores will be dropped.

**Assignments:** Four (4) assignments will be given that require you to interact with and reflect upon the course content. Assignments will be posted on Canvas. Each assignment must be submitted as a single pdf file on Canvas before the beginning of class time on the due date. Late assignments will be penalized at a rate of ten (10) percentage points per day or portion thereof. These assignments must be completed individually. Any submitted assignments bearing substantial similarities to each other will be assigned a score of zero.

**Exams:** There will be two midterm exams, held during class time, and one comprehensive final exam. The overall midterm exam score is calculated by averaging your two (2) highest scores out of these three (3) exams.

Midterm Exam I	February 23, 2023
Midterm Exam II	April 6, 2023
Final Exam Period	May 5 - May 11, 2023

You are permitted to bring a single 8.5"x11" double-sided sheet of notes to each exam. These notes must be written in your own handwriting; no typing or photocopying is permitted.

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.

**Oral Exam (Optional):** There will be an optional fifteen (15) minute oral exam. This will require you to present the solution to a problem of your choice and answer questions relating to the course content. Oral exams will take place during the last month of the semester.

**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	Dates	Topic
1	1/17 & 1/19	5.1: Structure of $\mathbb{R}^n$
2	1/24 & 1/26	5.2-5.3: Continuity and partial derivatives
3	1/31 & 2/2	5.4: Chain rule and Taylor's Theorem
4	2/7 & 2/9	6.1-6.2: Continuity and differentiability of transformations
5	2/14 & 2/16	6.3: Inverse Function Theorem
6	2/21 & 2/23	Review and Midterm (February 23)
7	2/28 & 3/2	6.4: Implicit Function Theorem
8	3/7 & 3/9	7.1-7.2: Multiple integrals
9	3/14 & 3/16	Spring Break – No Class
10	3/21 & 3/23	7.3: Change of variables in multiple integrals
11	3/28 & 3/30	8.1: Metric spaces
12	4/4 & 4/6	Review and Midterm (April 6)
13	4/11 & 4/13	8.2: Compact sets in metric spaces
14	4/18 & 4/20	8.3: Continuous functions on metric spaces
15	4/25 & 4/27	Extra/review
16	5/2 (No class)	Friday Schedule – No class

