

MATH 645: Analysis I

Fall 2020 Graduate 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: This is the first part of the two-semester course that introduces an application-minded student to foundations and modern techniques of real analysis. Topics covered in this course include measure and integration theory, L^p spaces, integral inequalities, topological and metric spaces, Banach and Hilbert spaces, contraction mapping, duality, weak convergence, compactness.

Number of Credits: 3

Prerequisites: MATH 546 or departmental approval.

Course-Section and Instructors

Course-Section	Instructor
Math 645-001	Professor A. Bose

Office Hours for All Math Instructors: [Fall 2020 Office Hours and Emails](#)

Required Textbooks:

Title	<i>Real Analysis</i>
Author	H.L. Royden and P.M. Fitzpatrick
Edition	4th
Publisher	Pearson
ISBN #	978-8120342804

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, November 9, 2020**. It will be strictly enforced.

OTHER TEXTS

- J. K. Hunter and B. Nachtergaele, *Applied Analysis*, World Scientific
- N. V. Kolmogorov and S. V. Fomin, *Introductory Real Analysis*, Dover

- W. Rudin, *Real and Complex Analysis*, 3rd edition, McGraw-Hill
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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	30%
Midterm Exam I	20%
Midterm Exam II	20%
Final Exam	30%

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**. **Please note that this course will be taught in the converged learning mode. Students may attend in-person or synchronously on-line.**

Homework Policy: Assignments will be regularly assigned and must be submitted electronically as a single scanned pdf in Canvas.

Exams: There will be two midterm exams with dates to be agreed upon by students. If not present while taking the exam, the student will have to upload a scanned pdf of their exam into Canvas. Further details will be provided.

Midterm Exam I	TBA
Midterm Exam II	TBA
Final Exam	December 12 - 21, 2020

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: 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

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Accommodation of Disabilities: Disability Support Services (DSS) 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 Chantonette Lyles, Associate Director of Disability Support Services at **973-596-5417** or via email at lyles@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Disability Support 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 Disability Support Services (DSS) website at:

- <https://www.njit.edu/studentsuccess/accessibility/>

Important Dates (See: [Fall 2020 Academic Calendar](#), [Registrar](#))

Date	Day	Event
September 1, 2020	T	First Day of Classes
September 5, 2020	S	Saturday Classes Begin
September 7, 2020	M	Labor Day
September 8, 2020	T	Monday Classes Meet
September 8, 2020	T	Last Day to Add/Drop Classes
November 9, 2020	M	Last Day to Withdraw
November 25, 2020	W	Friday Classes Meet
November 26-29, 2020	R - Su	Thanksgiving Recess - University Closed
December 10, 2020	R	Last Day of Classes
December 11 & 14, 2020	F & M	Reading Days
December 15 - 21, 2020	F - R	Final Exam Period

Course Outline

Week	Topics
1	The Real Numbers: Sets, Sequences, and Functions
2	Lebesgue Measure
3	Lebesgue Measurable Functions
4	Lebesgue Integration
5	Lebesgue Integration: Further Topics
6	Differentiation and Integration
7	The LP Spaces: Completeness and Approximation
8	The LP Spaces: Duality and Weak Convergence
FINAL EXAM WEEK: DECEMBER 15 - 21, 2020	

*Updated by Professor A. Bose - 8/3/2020
Department of Mathematical Sciences Course Syllabus, Fall 2020*