

THE DEPARTMENT OF MATHEMATICAL SCIENCES

**MATH 481-002: Advanced Calculus**  
*Spring 2020 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. Effective From: Spring 2009.

**Number of Credits:** 3

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

**Course-Section and Instructors**

| Course-Section | Instructor        |
|----------------|-------------------|
| Math 481-002   | Professor A. Bose |

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

**Required Textbook:**

|                        |  |
|------------------------|--|
| <b>Title</b>           | <i>Advanced Calculus</i>   |
| <b>Author</b>          | P. M. Fitzpatrick  |
| <b>Edition</b>         | 2nd  |
| <b>Publisher</b>       | AMS  |
| <b>ISBN #</b>          | 978-0821847916   |
| <b>Extra Materials</b> | W. Trench, <i>Introduction to Real Analysis</i> , Digital Commons@Trinity. Provided by instructor (or search <i>trench introduction to real analysis</i> for a pdf file) |

**University-wide Withdrawal Date:** The last day to withdraw with a **W** is **Monday, April 6, 2020**. It will be strictly enforced.

**COURSE ASSESSMENT**

**Criteria:** Outcomes are assessed through homework assignments, two midterm exams, and a comprehensive final exam.

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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          | 20% |
| Midterm Exams (2) | 50% |
| Final Exam        | 30% |

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

|    |          |   |         |
|----|----------|---|---------|
| A  | 88 - 100 | C | 60 - 68 |
| B+ | 82 - 87  | D | 55 - 59 |
| B  | 75 - 81  | F | 0 - 54  |
| C+ | 69 - 74  |   |         |

**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 Policy:** Homework assignments will be given frequently. Each assignment must be handed in at the beginning of class on the due date. Late assignments are NOT accepted. Solutions will be graded for correctness, completeness, and clarity.

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

|                 |                   |
|-----------------|-------------------|
| Midterm Exam I  | February 20, 2020 |
| Midterm Exam II | April 9, 2020     |
| Final Exam      | May 8 - 14, 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:** 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.

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## ADDITIONAL RESOURCES

**Math Tutoring Center:** Located in the Central King Building, Lower Level, Rm. G11 (See: [Spring 2020 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](#).

All students must familiarize themselves with and adhere to the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. The Department of Mathematical Sciences takes these policies very seriously and enforces them strictly.

**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](tel:973-596-5417) or via email at [lyles@njit.edu](mailto: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: [Spring 2020 Academic Calendar](#), Registrar)

| Date                | Day   | Event                                      |
|---------------------|-------|--|
| January 21, 2020    | T     | First Day of Classes                       |
| January 31, 2020    | F     | Last Day to Add/Drop Classes               |
| March 15 - 22, 2020 | Su-Su | Spring Recess: No Classes/ University Open |
| April 6, 2020       | M     | Last Day to Withdraw                       |
| April 10, 2020      | F     | Good Friday - University Closed            |
| May 5, 2020         | T     | Friday Classes Meet - Last Day of Classes  |
| May 6 & 7, 2020     | W & R | Reading Days                               |
| May 8 - 14, 2020    | F - R | Final Exam Period                          |

## Course Outline

| Topic   |
|---|
| 4.4 Sequences and Series of Functions<br>4.5 Power Series     |
| <i>Chapter 5 Real-Valued Functions of Several Variables</i>   |
| 5.1 Structure of $R^n$  |
| 5.2 Continuous Real-Valued Function of $n$ Variables          |
| 5.3 Partial Derivatives and the Differential                  |
| 5.4 The Chain Rule and Taylor's Theorem                       |
| <i>Chapter 6 Vector-Valued Functions of Several Variables</i> |

- 6.1 Linear Transformations and Matrices
- 6.2 Continuity and Differentiability of Transformations
- 6.3 The Inverse Function Theorem
- 6.4. The Implicit Function Theorem

*Chapter 7 Integrals of Functions of Several Variables*

- 7.1 Definition and Existence of the Multiple Integral
- 7.3 Change of Variables in Multiple Integrals
- Supplementary material on line integrals, surface integrals, Stokes Theorem and Divergence Theorem

*Chapter 8 Metric Spaces*

- 8.1 Introduction to Metric Spaces
- 8.2 Compact Sets in a Metric Space
- 8.3 Continuous Functions on Metric Spaces

*Updated by Professor A. Bose - 1/20/2020  
Department of Mathematical Sciences Course Syllabus, Spring 2020*

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