

Math 335, (Honors) Advanced Calculus

Lecture: MTWTh 10:30, LOW 115
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Text: *Advanced Calculus* (required)
Author: Gerald Folland

Math 335 investigates the properties of sequences and series of numbers and functions. It is an introduction to topics that will be covered in more depth, for example, in Math 424, 428, and 429. Before we start on these topics we will finish up the material on several variable calculus that remain from last quarter. I intend to cover the following topics. Fourier analysis and its applications are the highlights. Fourier analysis is the motivation for much of the development of modern analysis. You can blame it for the sharpening of the definition of function, $\epsilon - \delta$ definition continuity, Riemann integration, and the whole theory of convergence. You can't learn too much Fourier analysis.

1. Stokes's theorem and applications to physics
2. Infinite series
3. Uniform convergence
4. Introduction to power series

5. Improper integrals and special functions

6. Fourier Series

Homework will be collected at regular intervals and will count 20% of the course grade. There will be two 50 minute midterm tests which will count 20% of the course grade. The midterm tests will be closed book but you will be allowed to bring notes on **one side** of a notebook size sheet of paper. There will be a two hour closed book final exam which will count 40% of the course grade. For the final you will be allowed to bring notes on **both sides** of a notebook size sheet of paper. No calculators will be allowed on tests.

Here are the homework assignments :

| DATE | ASSIGNMENT (from Folland) |
|---------|--|
| Jan. 5 | §5.7: 1, 6, 7; §5.8: 1cf, 2, 3, 4 |
| Jan. 12 | §4.5: 1, 4, 5, 6; §4.6: 1e, 2b, 3e, 4, 8; §4.7, 3, 4 |
| Jan. 19 | §5.6: 1, 2; §6.1: 1c, 2bcd |
| Jan. 26 | §6.2: 2, 6, 8, 13, 19, 20, 21 |
| Jan. 29 | MIDTERM |
| Feb. 2 | §6.3: 1, 3, 4; §6.4: 5, 10, 14; §6.5: 3, 4 |
| Feb. 9 | §7.1: 1cd, 2ae, 3, 6, 8; §7.2: 1, 3, 6 |
| Feb. 16 | §7.3: 1, 3, 9, 11; §7.5: 3, 4, 6, 8, 11 |
| Feb. 23 | §7.6: 2, 3, 5; 8.1: 1, 2; §8.2: 1, 3ab |
| Feb 26 | MIDTERM |
| Mar. 2 | §8.3: 4, 5, 6; §8.4: 1; §8.5: 2, 7 |
| Mar. 9 | §8.6: 2, 3, 4, 5, 6, 9ac |
| Mar. 12 | FINAL EXAM (8:30-10:20 a.m.) |

These assignments are due at the beginning of class on the due date.