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**Math 675: Linear Analysis**  
George Mason University, Fall 2018

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**Instructor:**

Anton Lukyanenko  
alukyane@gmu.edu

**Office Hours:**

W 3-4:30pm & by appointment  
4113 Exploratory Hall

**Class:**

MW 5:55-7:10  
Robinson A 412

**Textbook:**

Introductory Real Analysis  
Kolmogorov and Fomin (ISBN 0-486-61226-0)

**Course content.** The goal of the course is to understand, at a deeper level, the geometry and topology of Euclidean space, and to extend this understanding to Banach spaces: infinite vector spaces with a Euclidean-like structure. This will allow us to interpret operators and functionals such as summations, integration, or the Fourier transform as functions between Banach spaces, and to discuss limits and maximal values in this broader context.

On a more applied level, the course will cover content tested by the Linear Analysis preliminary exam.

**Homework.** Homework will be due each Wednesday, and limited to two pages of typed text, and graded for both correctness and style (e.g. succinctness, clarity, overall look). LaTeX is highly recommended (try ShareLaTeX and Detexify to get started).

**Background.** Going into this graduate course, I expect you to be relatively fluent in mathematics and able to understand and provide definitions and proofs. You should be familiar with all of the content of Chapter 1 of the book, especially the sections 1.1-3.4.

**Grading.** In addition to the homework (worth 25% of the grade), there will be a midterm (25%) on October 17 and final exam (50%) on December 17.

**Attendance.** You should be in class, and you should participate in both in-class activities and lectures. Missing class or not participating should be an exception.

**Schedule** We will aim to cover two sub-sections per day:

**August**

27, 29: 5.1-2, 6.1-2

**September**

5: 6.3-4

10, 12: 6.5-6, 7.1, 7.4

17, 19: 8.1, 11.1-2, 13.1

24, 26: 13.2-5

**October**

1, 3: 13.6-14.3

9, 10: 14.4-5, 15.1-2

15, 17: 16.1-2, midterm

22, 24: 16.3-6

29, 31: 16.7-9, 18.1

**November**

5, 7: 18.2-3, 19.1-2

12, 14: 22.1-3, 23.1

26, 28: 23.4, 24.1-3

**December**

3, 5: Overflow and Review

17: Final exam, 4:30-7:15pm