

## SYLLABUS FOR MATH 4567 FOURIER ANALYSIS

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### Time and Location

MWF 1:25pm-2:15pm, Vincent Hall 311

### Textbook

J.W. Brown & R.V. Churchill, Fourier Series and Boundary Value Problems, 8th Edition.

### Office Hours

Monday 3:30pm-5:30pm, Friday 3:30pm-4:30pm, or by appointment

### Course materials

We will use Canvas to assign homework and provide additional course materials or information throughout the semester.

### Homework and Exams & Grading

There will be two (in class) midterm exams and one final exam. There will also be weekly homework, starting from week two. The last homework will not be collected. Three lowest homework grades will be dropped. Homework will be assigned at the beginning of the week and collected next Wednesday. Makeup midterms will only be given to students unable to attend the midterms with valid reasons, with approval from the instructor prior to the exam. Homework accounts for 20% of total score, each midterm 20%, and the final 40%.

Students achieving  $\geq 95\%$  of the total score are guaranteed to get an A,  $\geq 92\%$  A-, and  $\geq 86\%$  B+,  $\geq 83\%$  B,  $\geq 80\%$  B-,  $\geq 74\%$  C+,  $\geq 71\%$  C, 68% C-. Finally depending on the overall performance (and the difficulty of the exams, homework assignments, et al), we may curve the grade to improve the grading.

### Description of Course

This is a one semester course on Fourier Analysis, with applications to the study of linear partial differential equations. The basic idea of Fourier analysis is to decompose an arbitrary function into the sum simple functions, such as the sine and cosine functions. It turns out that this decomposition transforms differentiation into simple multiplications, and as a result Fourier analysis has become an extremely useful tool in the study of Partial differential equations which are equations involving derivatives of an unknown function (to be solved). Our goal is to cover chapter 1-8 of the textbook "Fourier Series and Boundary Value Problems". If time permits, we will also cover some applications of Fourier analysis in signal processing. See e.g. the wikipedia page for Fourier analysis for more background and links: [https://en.wikipedia.org/wiki/Fourier\\_analysis](https://en.wikipedia.org/wiki/Fourier_analysis)

### Important Dates

Wednesday February 19, First Midterm; Wednesday March 25, Second Midterm; Wednesday May 13, 1:30pm-3:30pm, Final