

# NOTES FOR THE FIRST HOUR EXAM

## Spring 2013

The first hour exam will be held on Monday, 25 Feb. starting at 9 : 20 and ending at 10 : 10. The exam will be closed book, closed note, closed laptop; no electronic devices such as calculators, phones, computers will be allowed during the exam. I will provide a list of useful formulae/results (such as equations for Fourier series and coefficients, results of indefinite integrals, etc.) so that you will not need to memorize equations. Review previous years' hour exams to see what this list of results/equations will look like.

The list of results will also include the results of any indefinite integral you might need to solve for Fourier coefficients; refer to previous years' exams to see the format in which this information will be provided.

The exam will cover all the material we have discussed in class, in computer lab, and that has been assigned for reading. On the exam, you will be expected to :

- Determine Fourier coefficients and Fourier series for series that are  $2\pi$  or  $2L$  periodic. You will also be expected to know how to find coefficients and Fourier series for complex Fourier series.
- Use and apply Dirichlet's Theorem and Parseval's Theorem.
- Prove identities using Einstein summation notation; if I ask that a question use summation notation, no credit will be given if you provide the proof writing out explicit components term by term.
- There will be a Mathematica related question on the exam. This will involve writing a short program making use of the Mathematica functions we have studied in lab thus far this semester. During the exam, I will answer any question about how to indicate special characters in Mathematica (i.e., ' how do you make the not - equal sign' (I will tell you " $\neq$ ")); however, I will not answer questions regarding functions and processes such as ' how do I integrate a function in Mathematica', ' which equal sign do I use in this case', or ' how do I write a Do loop'?

Keep in mind that the order of topics is different from the last two years, so take a look at both the first and second hour exams from last year to see what kinds of Fourier series and summation notation questions I asked.