NOTES FOR THE FIRST HOUR EXAM

Spring 2015

The first hour exam will be held on Wed., 25 Feb during normal class hours. The exam will be closed note, closed book and all electronic devices (including phones, computers, calculators) must be stored out of sight. I will remind the class of this before handing out exams. I will provide a list of formulae and results (such as equations for Fourier series and Fourier coefficients, the ϵ - δ relationship, and lists of indefinite integrals.) I will expect you to be able to do very elementary integrations such as cos x, sin x and polynomials.

I will provide results for any indefinite integral (apart from the elementary examples mentioned above), although you will need to evaluate them at appropriate limits and if necessary, evaluate Fourier coefficients.

The exam will cover all material discussed in class, computer lab and assigned for reading (in the text and online classnotes). You will be expected to :

• Determine Fourier coefficients and Fourier series for functions that are 2 π or 2 L periodic.

• Use and apply Dirichlet' s theorem.

• Understand and make use of the 2 π periodicity of trig functions.

• Demonstrate understanding of the convergence of Fourier series and be able to predict the form of a Fourier series based on the nature of the function (e.g., material in section 7.9)

• Prove vector identities using Einstein summation notation. No credit will be given for using explicit components term - by - term.

• I will ask you to write a short Mathematica program. You should know how to use the functions covered in lab including Sin, Cos, Integrate, Do, For, While, If, PrimeQ, EvenQ, OddQ, Print, Plot, ListPlot and Table. I will answer any question about how to indicate special characters (like ESC or $\int$), but will not answer things like "how does a Do loop work?" Syntax, spelling, and capitalization will count toward your score on this question.