APPM5405 – Spring 2006 – Notes on the final

The final covers the same material as the three midterms, as well as some (not much) material from Sections 12.6 – 12.8, and 13.1 – 13.4.

Chapter 8: Important concepts include projections, orthogonal decompositions of a Hilbert space, the Riesz representation theorem, the properties of self-adjoint operators. Recall that we did not cover the Fredholm alternative in as great detail as the book does.

Chapter 9: Focus on the spectral theorem for self-adjoint compact operators. There may be questions on other parts of the spectrum than the point spectrum, but if so, they will be part of the "hard" questions.

Chapter 11: Most of the material in sections 11.1 – 11.8 is included (with the exceptions described in the notes to the midterms). Make sure that you are fluent with the rules for how to "manipulate" distributions; you may find the review questions on homework 11 useful.

Chapter 12: On the final, two concepts from Chapter 12 will be emphasized: The convergence theorems (Lebesgue dominated convergence in particular), and L^p spaces. Of the inequalities in Section 12.7, you only need to know Hölder's and Minkowski's. The material on measures, the definition of the Lebesgue integral, and Fubini's theorem will *not* be emphasized.

Chapter 13: The syllabus is defined by the lecture notes posted on the class website. There will be no questions on the implicit function theorem, and if there is a question on the inverse function theorem, it will be straightforward. Make sure you know how to compute a derivative of a given map between two Banach spaces.