Math 556: Linear Analysis
(Spring 2009)

Lectures: MWF 12:30–1:20, room C-036 Padelford
Professor: Anne Greenbaum,   C-434 Padelford, 543-1175
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                 Course materials: Click on "Math 556".

Text:

1. Friedlander *Introduction to Distribution Theory.*

Reserve list: The following books are on reserve in the Mathematics Research Library.

1. Friedlander, *Introduction to Distribution Theory.*

2. Jones, *Lebesgue Integration on Euclidean Space.*

3. Riesz and Sz.-Nagy, *Functional Analysis.*

4. Dym and McKean, *Fourier Series and Integrals.*

5. Epstein, *Partial Differential Equations: An Introduction.*

6. Kreiss and Oliger, *Methods for the Approximate Solution of Time-Dependent Problems.*

7. Bremermann, *Distributions, Complex Variables, and Fourier Transforms.*

8. Stakgold, *Boundary Value Problems of Mathematical Physics.*

Friedlander will be the main text for the second half of the course on distributions. The first half will cover selected material from Jones, Kreiss and Oliger, and Riesz and Sz.-Nagy. The book by Dym and McKean is a good reference on Fourier analysis. Epstein has a nice presentation of the Fredholm theory of compact operators with application to integral equations. Kreiss and Oliger is an introduction to time-dependent PDE's and their numerical approximation. Bremermann and Stakgold are additional good references on distribution theory.

Material:
 Autumn quarter: Linear algebra and start of ODE's
 Winter quarter: Ordinary differential equations (continued), functional analysis, Fourier series
 Spring quarter: Fourier transforms, compact operators and integral equations,
                   partial differential equations, distribution theory

Spring quarter: The first half of the course will cover Fourier transforms (continued); time-dependent PDE's and their numerical approximation; compact operators with application to integral equations; spectral theory of bounded linear operators with application to Sturm-Liouville problems. The second half of the course will cover distribution theory, following Friedlander.