FURTHER READING

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This is a sampling of some texts in subjects related to the courses that I usually teach, limited to books that I happen to know and/or like.

1. Linear Algebra

(1) G. Strang, *Introduction to Linear Algebra*, Wellesley–Cambridge Press, 1993. Good introduction to finite-dimensional matrix theory.

(2) R. A. Horn and C. R. Johnson, *Matrix Analysis*, Cambridge, 1985. Lots of information on matrix algebra, yet reasonably accessible and concrete.

2. Undergraduate Real Analysis

(1) W. Rudin, *Principles of Mathematical Analysis*, McGraw–Hill, 1964. Affectionately referred to as "baby Rudin" (to distinguish it from "big Rudin," listed in the next section). This is a little old, but it is the book you should be familiar with.

(2) R. Bartle, *The Elements of Real Analysis*, Second Edition, Wiley, 1976. This text is often used here at Georgia Tech for undergraduate analysis.

3. Graduate Real Analysis

(1) R. Wheeden and A. Zygmund, *Measure and Integral*, Marcel Dekker, 1977. This is the book I learned real analysis from, so of course I like it. Lebesgue measure is presented first, and abstract measure theory later.

(2) E. M. Stein and R. Shakarchi, *Real Analysis*, Princeton University Press, 2005. This is a recent text. Like Wheedon and Zygmund, it focuses on Lebesgue measure. Well-written, a good choice for a first text.

(3) G. Folland, *Real Analysis*, Second Edition, Wiley, 1999. This is the book that you need to read and understand. However, it is not the easiest book to learn the subject from. After you have read another book, read this in detail.

(4) W. Rudin, *Real and Complex Analysis*, 3rd edition, McGraw–Hill, 1987. This is the alternative to Folland. This book, or Folland, should be the second text on Real Analysis that you read, and you should read it in detail.

4. Hilbert Space Theory

(1) L. Debnath and P. Mikusiński, *Introduction to Hilbert Spaces with Applications*, Second Edition, Academic Press, 1999. I often use this as a text for Hilbert spaces. Fairly well written but has occasional annoying lapses.

(2) I. Gohberg and S. Goldberg, *Basic Operator Theory*, Birkhäuser, 2001 (reprint of the 1981 original). A good introduction to Hilbert space theory. The typeface is not very stylish, but don't hold that against it.

5. Functional Analysis

Functional analysis is an outgrowth/combination/extension of Hilbert space and real analysis. So the texts are generally more difficult than those listed in the Hilbert space section.

(1) J. B. Conway, *A Course in Functional Analysis*, 2nd edition, Springer–Verlag, 1990. A little dense, but this is the material that you need to know.

(2) E. Kreyszig, *Introductory Functional Analysis with Applications*, Wiley, 1978.

(3) A. W. Naylor and G. R. Sell, *Linear Operator Theory in Engineering and Science*, Springer, 1982.

6. Harmonic Analysis

Harmonic analysis and wavelet theory are my own research areas.

(1) R. Young, *An Introduction to Nonharmonic Fourier Series*, Academic Press, 1980. This is an excellent book on Fourier series, with considerable material on Hilbert spaces, functional analysis, and frame theory.

(2) J. Benedetto, *Harmonic Analysis and Applications*, CRC Press, 1997. Written by my advisor.

(3) Y. Katznelson, *An Introduction to Harmonic Analysis*, 3rd edition, Cambridge University Press, 2004. This is a classic text, available in paperback. Although somewhat dense, it contains a wealth of material on both Fourier series and Fourier transforms.

(4) H. Dym and H. P. McKean, *Fourier Series and Integrals*, Academic Press, New York, 1972. This is a charming book, which contains a number of applications as well as the basic theory of Fourier series and the Fourier transform.

(5) K. Gröchenig, *Foundations of Time-Frequency Analysis*, Birkhäuser, 2001. Written by one of my coauthors, it is beautiful introduction to the field of time-frequency analysis, which could also be called "local Fourier analysis."

7. Wavelets

(1) I. Daubechies, *Ten Lectures on Wavelets*, SIAM, 1992. If you've got some background in real analysis, then this is a terrific book. It doesn't do applications, but it does gives you a sense of connections to other fields.

(2) Y. Meyer, *Wavelets: Algorithms and Applications*, SIAM, 1993. An entertaining survey of wavelet theory, but does not contain much mathematics.

(3) G. Strang and T. Nguyen, *Wavelets and Filter Banks*, Wellesley–Cambridge Press, 1995. Written by a mathematician and an engineer; presents the mathematics using filter bank language.