

清華大學數學系
實變函數論二 **Real Analysis (II)**

Math 5131 Spring 2007

Chapter 7. The L^p Spaces

- 7.1. Hölder's and Minkowski's inequalities
- 7.2. The ℓ^p spaces
- 7.3. Completeness and convergence
- 7.4. Orthogonality in L^2

Chapter 8. Approximations of the Identity; Maximal Functions

- 8.1. Convolutions
- 8.2. Approximations of the identity
- 8.3. The Hardy-Littlewood maximal function
- 8.4. The Marcinkiewicz integral

Chapter 9. Measure and Integration

- 9.1. Additive set functions and measures
- 9.2. Signed measures
- 9.3. Measurable functions
- 9.4. Integration and convergence theorems
- 9.5. The Radon-Nikodym theorem
- 9.6. L^p spaces

Chapter 10. Measure and Outer Measure

- 10.1. Outer measure and measurability
- 10.2. Metric outer measure
- 10.3. Lebesgue-Stieltjes measure
- 10.4. Hausdorff measure
- 10.5. The Carathéodory-Hahn extension theorem
- 10.6. Product measures

Chapter 11. Fourier Analysis

- 11.1. Fourier series and Parseval's formula
- 11.2. Properties of Fourier coefficients
- 11.3. Convergence of Fourier series
- 11.4. Divergence of Fourier series
- 11.5. Summability of sequences and series
- 11.6. Summability of Fourier series

Midterm Exam 1 (Wednesday, April 11): Section 6.6, Chapter 7 ~ 8, Sections 9.1 ~ 9.2

Midterm Exam 2 (Wednesday, May 16): Chapter 9, Sections 10.1 ~ 10.4

Final Exam (Tuesday, June 26): Chapter 7 ~ Chapter 11