Math 335, Section 1, Real Analysis
Fall 1997
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Text: Protter & Morrey, A First Course in Real Analysis, 2nd Ed.

I consider the book appropriate for a year long course in real analysis which spends about a semester on analysis in 1 variable and about a semester on analysis in several variables. It has an excellent choice of topics, is well-written, and includes lots of examples. The problems range from easy to medium in level of difficulty. I would use it again. The students find the book hard to read; they would find any analysis book hard to read. Among analysis books, I would rank this as fairly easy.

Material covered

CHAPTER 1 The Real Number System
    1.1 Axioms for a Field
    1.2 Natural Numbers and Sequences
    1.3 Inequalities
    1.4 Mathematical Induction

CHAPTER 2 Continuity and Limits
    2.1 Continuity
    2.2 Limits
    2.3 One-Sided Limits
    2.4 Limits at Infinity; Infinite Limits
    2.5 Limits of Sequences

CHAPTER 3 Basic Properties of Functions on $\mathbf{R}^1$
    3.1 The Intermediate-Value Theorem
    3.2 Least Upper Bound; Greatest Lower Bound
    3.3 The Bolzano-Weierstrass Theorem
    3.4 The Boundedness and Extreme-Value Theorems
    3.5 Uniform Continuity
    3.6 The Cauchy Criterion
    3.7 The Heine-Borel and Lebesgue Theorems (Lebesgue Theorem skipped)

CHAPTER 4 Elementary Theory of Differentiation
    4.1 The Derivative in $\mathbf{R}^1$
    4.2 Inverse Functions in $\mathbf{R}^1$

CHAPTER 5 Elementary Theory of Integration
    5.1 The Darboux Integral for Functions on $\mathbf{R}^1$
    5.2 The Riemann Integral
    5.3 The Logarithm and Exponential Functions

CHAPTER 9 Infinite Sequences and Infinite Series