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Mathematical Analysis: Foundations and Advanced Techniques for Functions of Several Variables builds upon the basic ideas and techniques of differential and integral calculus for functions of several variables, as outlined in an earlier introductory volume. The presentation is largely focused on the foundations of measure and integration theory.

The book begins with a discussion of the geometry of Hilbert spaces, convex functions and domains, and differential forms, particularly k-forms. The exposition continues with an introduction to the calculus of variations with applications to geometric optics and mechanics. The authors conclude with the study of measure and integration theory - Borel, Radon, and Hausdorff measures and the derivation of measures. An appendix highlights important mathematicians and other scientists whose contributions have made a great impact on the development of theories in analysis.

This work may be used as a supplementary text in the classroom or for self-study by advanced undergraduate and graduate students and as a valuable reference for researchers in mathematics, physics, and engineering. One of the key strengths of this presentation, along with the other four books on analysis published by the authors, is the motivation for understanding the subject through examples, observations, exercises, and illustrations.