



Fabio Silva Botelho

Real Analysis and Applications

- Starts from basic concepts and extends to n-dimensional, multi-variable real analysis
- Self-contained, with easy-to-follow proofs
- Provides elegant proofs of the implicit theorem for the vectorial case by applying the Banach fixed-point theorem

This textbook introduces readers to real analysis in one and n dimensions. It is divided into two parts: Part I explores real analysis in one variable, starting with key concepts such as the construction of the real number system, metric spaces, and real sequences and series. In turn, Part II addresses the multi-variable aspects of real analysis. Further, the book presents detailed, rigorous proofs of the implicit theorem for the vectorial case by applying the Banach fixed-point theorem and the differential forms concept to surfaces in \mathbb{R}^n . It also provides a brief introduction to Riemannian geometry. With its rigorous, elegant proofs, this self-contained work is easy to read, making it suitable for undergraduate and beginning graduate students seeking a deeper understanding of real analysis and applications, and for all those looking for a well-founded, detailed approach to real analysis.

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