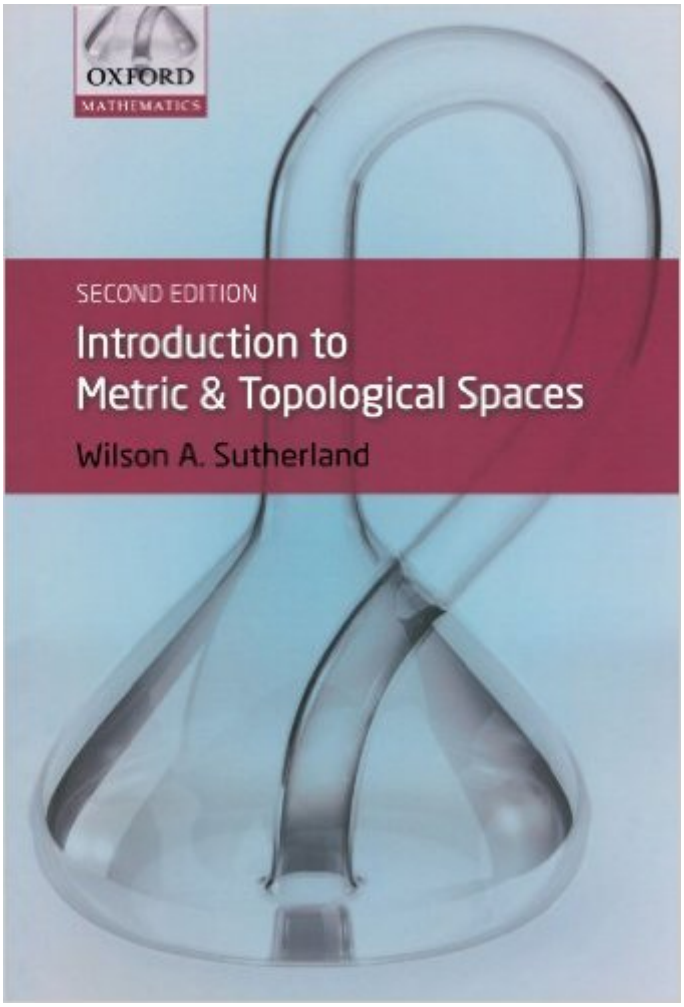
Introduction To Metric And Topological Spaces (Oxford Mathematics)



Synopsis

One of the ways in which topology has influenced other branches of mathematics in the past few decades is by putting the study of continuity and convergence into a general setting. This new edition of Wilson Sutherland's classic text introduces metric and topological spaces by describing some of that influence. The aim is to move gradually from familiar real analysis to abstract topological spaces, using metric spaces as a bridge between the two. The language of metric and topological spaces is established with continuity as the motivating concept. Several concepts are introduced, first in metric spaces and then repeated for topological spaces, to help convey familiarity. The discussion develops to cover connectedness, compactness and completeness, a trio widely used in the rest of mathematics. Topology also has a more geometric aspect which is familiar in popular expositions of the subject as `rubber-sheet geometry', with pictures of MÃ¶bius bands, doughnuts, Klein bottles and the like; this geometric aspect is illustrated by describing some standard surfaces, and it is shown how all this fits into the same story as the more analytic developments. The book is primarily aimed at second- or third-year mathematics students. There are numerous exercises, many of the more challenging ones accompanied by hints, as well as a companion website, with further explanations and examples as well as material supplementary to that in the book.

Book Information

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Customer Reviews

I purchased Introduction to Metric and Topological Spaces two years ago. I was unprepared for its

rigor. I am not a mathematics major, but I enjoy reading mathematics. My background includes calculus, linear algebra, differential equations, and other applied mathematics, but I have not had a course in real analysis. W. A. Sutherland intended this text as the next step after analysis.After a brief foray, I retreated, placed Sutherland back on my bookshelf, and attacked some marginally easier introductory texts: Metric Spaces by Victor Bryant, Introduction to Topology by Bert Mendelson, and most recently, several chapters in Introduction to Analysis by Maxwell Rosenlicht. I periodically return to W. A. Sutherland's text to measure my understanding. I am now working on chapter five, Compact Spaces.I doubt that Introduction to Metric and Topological Spaces would be foreboding to students that are familiar with real analysis. Sutherland understands that the abstractness and generalization can be difficult and shows concern with motivating the student. He repeatedly attempts to illustrate the value of generalization, especially in the study of continuity.Sutherland often uses a lengthy series of examples of increasing difficulty to illustrate abstract concepts. In his discussion of metric spaces, we begin with Euclidian n-space metrics, and move on to discrete metric spaces, function spaces, and even Hilbert sequence spaces. He introduces open sets and topological spaces in a similar fashion.The author occasionally suggests that the student might wish to make a geometrical diagram to help clarify some subtle point, but Sutherland includes few geometrical drawings in his text. His focus is clearly on proofs using the axioms of metric spaces and topological spaces.

Topological Insulators (Springer Theses) Differential Geometry, Lie Groups, and Symmetric Spaces, Volume 80 (Pure and Applied Mathematics) Sobolev Spaces, Volume 140, Second Edition (Pure and Applied Mathematics) Convexity and Optimization in Banach Spaces (Springer Monographs in Mathematics) Composition Operators on Spaces of Analytic Functions (Studies in Advanced Mathematics) Classical Banach Spaces (Lecture Notes in Mathematics)