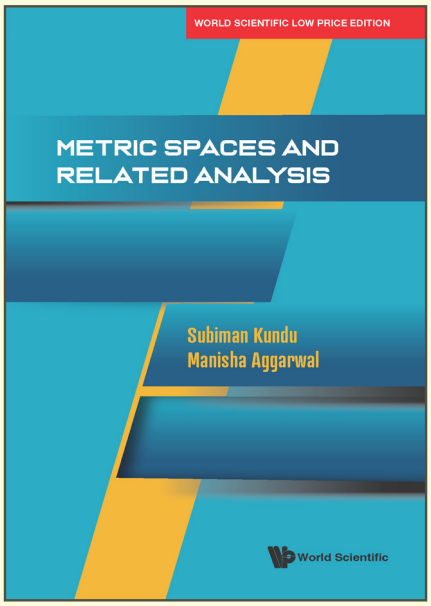
Metric Spaces and Related Analysis



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ABOUT THE BOOK

This book offers the comprehensive study of one of the foundational topics in Mathematics, known as Metric Spaces. The book delivers the concepts in an appropriate and concise manner, at the same time rich in illustrations and exercise problems. Special focus has been laid on important theorems like Baire's Category theorem, Heine–Borel theorem, Ascoli–Arzela Theorem, etc, which play a crucial role in the study of metric spaces.

The additional chapter on Cofinal completeness, UC spaces and finite chainability makes the text unique of its kind. This helps the students in:

1. taking the secondary step towards analysis on metric spaces,
2. realizing the connection between the two most important classes of functions, continuous functions and uniformly continuous functions,
3. understanding the gap between compact metric spaces and complete metric spaces.

Readers will also find brief discussions on various subtleties of continuity like subcontinuity, upper semi-continuity, lower semi-continuity, etc. The interested readers will be motivated to explore the special classes of functions between metric spaces to further extent.

Consequently, the book becomes a complete package: it makes the foundational pillars strong and develops the interest of students to pursue research in metric spaces. The book is useful for third and fourth year undergraduate students and it is also helpful for graduate students and researchers.

READERSHIP

Undergraduate and graduate students, researchers in the areas of real analysis, analysis on metric spaces, real functions, topology, functional analysis.

CONTENTS

- Fundamentals of Analysis
- Continuity and Some Stronger Notions
- Complete Metric Spaces
- Compactness
- Weaker Notions of Compactness
- Real-Valued Functions on Metric Spaces
- Connectedness

ABOUT THE AUTHORS

In 1989, **Subiman Kundu** completed his PhD on function spaces at Virginia Tech., USA under the supervision of Prof. Robert A McCoy. For more than three decades, he served at Department of Mathematics, Indian Institute of Technology Delhi, India. In 2022, he has retired as a professor of Mathematics from the same department. In addition to research, he enjoyed teaching pretty much. At present, he is engaged in writing several books.

Manisha Aggarwal completed her PhD in Mathematics at Indian Institute of Technology Delhi, India in 2016 under the supervision of Prof. Subiman Kundu. Since then, she has been teaching at St. Stephen's College, University of Delhi, India. Her research interest is analysis on metric spaces. Her passion for teaching and research has motivated her to write textbooks for undergraduates and postgraduates in collaboration with her PhD supervisor..

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