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Introduction to Topology

Concise undergraduate introduction to fundamentals of topology — clearly and engagingly written, and filled with stimulating, imaginative exercises. Topics include set theory, metric and topological spaces, connectedness, and compactness. 1975 edition.

Introduction to Topology

This text explains nontrivial applications of metric space topology to analysis. Covers metric space, point-set topology, and algebraic topology. Includes exercises, selected answers, and 51 illustrations. 1983 edition.

Introduction to Topology

An undergraduate introduction to the fundamentals of topology -- engagingly written, filled with helpful insights, complete with many stimulating and imaginative exercises to help students develop a solid grasp of the subject.

Introductory Topology

The book offers a good introduction to topology through solved exercises. It is mainly intended for undergraduate students. Most exercises are given with detailed solutions.

Introduction to Topology

First course in algebraic topology for advanced undergraduates. Homotopy theory, the duality theorem, relation of topological ideas to other branches of pure mathematics. Exercises and problems. 1972 edition.

A Geometric Introduction to Topology

Over the last number of years powerful new methods in analysis and topology have led to the development of the modern global theory of symplectic topology, including several striking and important results. The first edition of Introduction to Symplectic Topology was published in 1995. The book was the first comprehensive introduction to the subject and became a key text in the area. A significantly revised second edition was published in 1998 introducing new sections and updates on the fast-developing area. This new third edition includes updates and new material to bring the book right up-to-date.

Introduction to Symplectic Topology

Knot theory is a kind of geometry, and one whose appeal is very direct because the objects studied are perceivable and tangible in everyday physical space. It is a meeting ground of such diverse branches of mathematics as group theory, matrix theory, number theory, algebraic geometry, and differential geometry, to name some of the more prominent ones. It had its origins in the mathematical theory of electricity and in primitive atomic physics, and there are hints today of new applications in certain branches of chemistry. The outlines of the modern topological theory were worked out by Dehn, Alexander, Reidemeister, and Seifert almost thirty years ago. As a subfield of topology, knot theory forms the core of a wide range of problems dealing with the position of one manifold imbedded within another. This book, which is an elaboration of a series of lectures given by Fox at Haverford College while a Philips Visitor there in the spring of 1956, is an attempt to make the subject accessible to everyone. Primarily it is a text book for a course at the junior-senior level, but we believe that it can be used with profit also by graduate students. Because the algebra required is not the familiar commutative algebra, a disproportionate amount of the book is given over to necessary algebraic preliminaries.

Introduction to Knot Theory

Students must prove all of the theorems in this undergraduate-level text, which features extensive outlines to assist in study and comprehension. Thorough and well-written, the treatment provides sufficient material for a one-year undergraduate course. The logical presentation anticipates students' questions, and complete definitions and expositions of topics relate new concepts to previously discussed subjects. Most of the material focuses on point-set topology with the exception of the last chapter. Topics include sets and functions, infinite sets and transfinite numbers, topological spaces and basic concepts, product spaces, connectivity, and compactness. Additional subjects include separation axioms, complete spaces, and homotopy and the fundamental group. Numerous hints and figures illuminate the text. Dover (2014) republication of the edition originally published by The Williams & Wilkins Company, Baltimore, 1975. See every Dover book in print at www.doverpublications.com

A First Course in Topology

Superb one-year course in classical topology. Topological spaces and functions, point-set topology, much more. Examples and problems. Bibliography. Index.

Topology

The aim of the book is to give a broad introduction of topology to undergraduate students. It covers the most important and useful parts of the point-set as well as the combinatorial topology. The development of the material is from simple to complex, concrete to abstract, and appeals to the intuition of readers. Attention is also paid to how topology is actually used in the other fields of mathematics. Over 150 illustrations, 160 examples and 600 exercises will help readers to practice and fully understand the subject. Contents: Set and Map Metric Space Graph Topology Topological Concepts Complex Topological Properties Surface Topics in Point Set Topology Index

Introduction to Topology

This excellent introduction to topology eases first-year math students and general readers into the subject by surveying its concepts in a descriptive and intuitive way, attempting to build a bridge from the familiar concepts of geometry to the formalized study of topology. The first three chapters focus on

congruence classes defined by transformations in real Euclidean space. As the number of permitted transformations increases, these classes become larger, and their common topological properties become intuitively clear. Chapters 4–12 give a largely intuitive presentation of selected topics. In the remaining five chapters, the author moves to a more conventional presentation of continuity, sets, functions, metric spaces, and topological spaces. Exercises and Problems. 101 black-and-white illustrations. 1974 edition.

From Geometry to Topology

This text covers topological spaces and properties, some advanced calculus, differentiable manifolds, orientability, submanifolds and an embedding theorem, tangent spaces, vector fields and integral curves, Whitney's embedding theorem, more. Includes 88 helpful illustrations. 1982 edition.

Differential Topology

Foundations of General Topology presents the value of careful presentations of proofs and shows the power of abstraction. This book provides a careful treatment of general topology. Organized into 11 chapters, this book begins with an overview of the important notions about cardinal and ordinal numbers. This text then presents the fundamentals of general topology in logical order processing from the most general case of a topological space to the restrictive case of a complete metric space. Other chapters consider a general method for completing a metric space that is applicable to the rationals and present the sufficient conditions for metrizability. This book discusses as well the study of spaces of real-valued continuous functions. The final chapter deals with uniform continuity of functions, which involves finding a distance that satisfies certain requirements for all points of the space simultaneously. This book is a valuable resource for students and research workers.

Foundations of General Topology

Advanced text includes elementary general topology, algebraic topology, 2-manifolds covering spaces and fundamental groups. Problems, with selected solutions.

Topology

In recent years, many students have been introduced to topology in high school mathematics. Having met the Mobius band, the seven bridges of Königsberg, Euler's polyhedron formula, and knots, the student is led to expect that these picturesque ideas will come to full flower in university topology courses. What a disappointment "undergraduate topology" proves to be! In most institutions it is either a service course for analysts, on abstract spaces, or else an introduction to homological algebra in which the only geometric activity is the completion of commutative diagrams. Pictures are kept to a minimum, and at the end the student still does not understand the simplest topological facts, such as the reason why knots exist. In my opinion, a well-balanced introduction to topology should stress its intuitive geometric aspect, while admitting the legitimate interest that analysts and algebraists have in the subject. At any rate, this is the aim of the present book. In support of this view, I have followed the historical development where practicable, since it clearly shows the influence of geometric thought at all stages. This is not to claim that topology received its main impetus from geometric recreations like the seven bridges; rather, it resulted from the visualization of problems from other parts of mathematics—complex analysis (Riemann), mechanics (Poincaré), and group theory (Dehn). It is these connections to other parts of mathematics which make topology an important as well as a beautiful subject.

Classical Topology and Combinatorial Group Theory

An Illustrated Introduction to Topology and Homotopy explores the beauty of topology and homotopy theory in a direct and engaging manner while illustrating the power of the theory through many, often surprising, applications. This self-contained book takes a visual and rigorous approach that incorporates both extensive illustrations and full proofs

Introduction to General Topology

Topology is one of the most rapidly expanding areas of mathematical thought: while its roots are in geometry and analysis, topology now serves as a powerful tool in almost every sphere of mathematical study. This book is intended as a first text in topology, accessible to readers with at least three semesters

of a calculus and analytic geometry sequence. In addition to superb coverage of the fundamentals of metric spaces, topologies, convergence, compactness, connectedness, homotopy theory, and other essentials, Elementary Topology gives added perspective as the author demonstrates how abstract topological notions developed from classical mathematics. For this second edition, numerous exercises have been added as well as a section dealing with paracompactness and complete regularity. The Appendix on infinite products has been extended to include the general Tychonoff theorem; a proof of the Tychonoff theorem which does not depend on the theory of convergence has also been added in Chapter 7.

An Illustrated Introduction to Topology and Homotopy

Among the best available reference introductions to general topology, this volume is appropriate for advanced undergraduate and beginning graduate students. Includes historical notes and over 340 detailed exercises. 1970 edition. Includes 27 figures.

Elementary Topology

This material is intended to contribute to a wider appreciation of the mathematical words "continuity and linearity". The book's purpose is to illuminate the meanings of these words and their relation to each other --- Product Description.

General Topology

In this book, which may be used as a self-contained text for a beginning course, Professor Lefschetz aims to give the reader a concrete working knowledge of the central concepts of modern combinatorial topology: complexes, homology groups, mappings in spheres, homotopy, transformations and their fixed points, manifolds and duality theorems. Each chapter ends with a group of problems. Originally published in 1949. The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

An Introduction to Algebraic Topology

Combining concepts from topology and algorithms, this book delivers what its title promises: an introduction to the field of computational topology. Starting with motivating problems in both mathematics and computer science and building up from classic topics in geometric and algebraic topology, the third part of the text advances to persistent homology. This point of view is critically important in turning a mostly theoretical field of mathematics into one that is relevant to a multitude of disciplines in the sciences and engineering. The main approach is the discovery of topology through algorithms. The book is ideal for teaching a graduate or advanced undergraduate course in computational topology, as it develops all the background of both the mathematical and algorithmic aspects of the subject from first principles. Thus the text could serve equally well in a course taught in a mathematics department or computer science department.

Introduction to Topology and Modern Analysis

An easily accessible introduction to over three centuries of innovations in geometry Praise for the First Edition "... a welcome alternative to compartmentalized treatments bound to the old thinking. This clearly written, well-illustrated book supplies sufficient background to be self-contained." —CHOICE This fully revised new edition offers the most comprehensive coverage of modern geometry currently available at an introductory level. The book strikes a welcome balance between academic rigor and accessibility, providing a complete and cohesive picture of the science with an unparalleled range of topics. Illustrating modern mathematical topics, Introduction to Topology and Geometry, Second Edition discusses introductory topology, algebraic topology, knot theory, the geometry of surfaces, Riemann geometries, fundamental groups, and differential geometry, which opens the doors to a wealth of applications. With its logical, yet flexible, organization, the Second Edition: • Explores historical notes interspersed throughout the exposition to provide readers with a feel for how the mathematical disciplines and theorems came into being • Provides exercises ranging from routine to challenging,

allowing readers at varying levels of study to master the concepts and methods • Bridges seemingly disparate topics by creating thoughtful and logical connections • Contains coverage on the elements of polytope theory, which acquaints readers with an exposition of modern theory Introduction to Topology and Geometry, Second Edition is an excellent introductory text for topology and geometry courses at the upper-undergraduate level. In addition, the book serves as an ideal reference for professionals interested in gaining a deeper understanding of the topic.

Introduction to Topology

Learn the basics of point-set topology with the understanding of its real-world application to a variety of other subjects including science, economics, engineering, and other areas of mathematics. Introduces topology as an important and fascinating mathematics discipline to retain the readers interest in the subject. Is written in an accessible way for readers to understand the usefulness and importance of the application of topology to other fields. Introduces topology concepts combined with their real-world application to subjects such DNA, heart stimulation, population modeling, cosmology, and computer graphics. Covers topics including knot theory, degree theory, dynamical systems and chaos, graph theory, metric spaces, connectedness, and compactness. A useful reference for readers wanting an intuitive introduction to topology.

Computational Topology

Topology is a natural, geometric, and intuitively appealing branch of mathematics that can be understood and appreciated by students as they begin their study of advanced mathematical topics. Designed for a one-semester introduction to topology at the undergraduate and beginning graduate levels, this text is accessible to students familiar with multivariable calculus. Rigorous but not abstract, the treatment emphasizes the geometric nature of the subject and the applications of topological ideas to geometry and mathematical analysis. Customary topics of point-set topology include metric spaces, general topological spaces, continuity, topological equivalence, basis, subbasis, connectedness, compactness, separation properties, metrization, subspaces, product spaces, and quotient spaces. In addition, the text introduces geometric, differential, and algebraic topology. Each chapter includes historical notes to put important developments into their historical framework. Exercises of varying degrees of difficulty form an essential part of the text.

Introduction to Topology and Geometry

"Topology can present significant challenges for undergraduate students of mathematics and the sciences. 'Understanding topology' aims to change that. The perfect introductory topology textbook, 'Understanding topology' requires only a knowledge of calculus and a general familiarity with set theory and logic. Equally approachable and rigorous, the book's clear organization, worked examples, and concise writing style support a thorough understanding of basic topological principles. Professor Shaun V. Ault's unique emphasis on fascinating applications, from chemical dynamics to determining the shape of the universe, will engage students in a way traditional topology textbooks do not"--Back cover.

Introduction to Topology

"The clarity of the author's thought and the carefulness of his exposition make reading this book a pleasure," noted the Bulletin of the American Mathematical Society upon the 1955 publication of John L. Kelley's General Topology. This comprehensive treatment for beginning graduate-level students immediately found a significant audience, and it remains a highly worthwhile and relevant book for students of topology and for professionals in many areas. A systematic exposition of the part of general topology that has proven useful in several branches of mathematics, this volume is especially intended as background for modern analysis. An extensive preliminary chapter presents mathematical foundations for the main text. Subsequent chapters explore topological spaces, the Moore-Smith convergence, product and quotient spaces, embedding and metrization, and compact, uniform, and function spaces. Each chapter concludes with an abundance of problems, which form integral parts of the discussion as well as reinforcements and counter examples that mark the boundaries of possible theorems. The book concludes with an extensive index that provides supplementary material on elementary set theory.

Principles of Topology

Over 140 examples, preceded by a succinct exposition of general topology and basic terminology. Each example treated as a whole. Numerous problems and exercises correlated with examples. 1978 edition. Bibliography.

Understanding Topology

The first half of the book provides an introduction to general topology, with ample space given to exercises and carefully selected applications. The second half of the text includes topics in asymmetric topology, a field motivated by applications in computer science. Recurring themes include the interactions of topology with order theory and mathematics designed to model loss-of-resolution situations.

Introduction to Topology

Topology continues to be a topic of prime importance in contemporary mathematics, but until the publication of this book there were few if any introductions to topology for undergraduates. This book remedied that need by offering a carefully thought-out, graduated approach to point set topology at the undergraduate level. To make the book as accessible as possible, the author approaches topology from a geometric and axiomatic standpoint; geometric, because most students come to the subject with a good deal of geometry behind them, enabling them to use their geometric intuition; axiomatic, because it parallels the student's experience with modern algebra, and keeps the book in harmony with current trends in mathematics. After a discussion of such preliminary topics as the algebra of sets, Euler-Venn diagrams and infinite sets, the author takes up basic definitions and theorems regarding topological spaces (Chapter 1). The second chapter deals with continuous functions (mappings) and homeomorphisms, followed by two chapters on special types of topological spaces (varieties of compactness and varieties of connectedness). Chapter 5 covers metric spaces. Since basic point set topology serves as a foundation not only for functional analysis but also for more advanced work in point set topology and algebraic topology, the author has included topics aimed at students with interests other than analysis. Moreover, Dr. Baum has supplied quite detailed proofs in the beginning to help students approaching this type of axiomatic mathematics for the first time. Similarly, in the first part of the book problems are elementary, but they become progressively more difficult toward the end of the book. References have been supplied to suggest further reading to the interested student.

General Topology

The book starts with the basic concepts of topology and topological spaces followed by metric spaces, continuous functions, compactness, separation axioms, connectedness and product topology.

Counterexamples in Topology

For a senior undergraduate or first year graduate-level course in Introduction to Topology. Appropriate for a one-semester course on both general and algebraic topology or separate courses treating each topic separately. This title is part of the Pearson Modern Classics series. Pearson Modern Classics are acclaimed titles at a value price. Please visit www.pearsonhighered.com/math-classics-series for a complete list of titles. This text is designed to provide instructors with a convenient single text resource for bridging between general and algebraic topology courses. Two separate, distinct sections (one on general, point set topology, the other on algebraic topology) are each suitable for a one-semester course and are based around the same set of basic, core topics. Optional, independent topics and applications can be studied and developed in depth depending on course needs and preferences.

Topology

Accessible but rigorous, this outstanding text encompasses all of the topics covered by a typical course in elementary abstract algebra. Its easy-to-read treatment offers an intuitive approach, featuring informal discussions followed by thematically arranged exercises. This second edition features additional exercises to improve student familiarity with applications. 1990 edition.

General Topology

Elements of Point Set Topology

