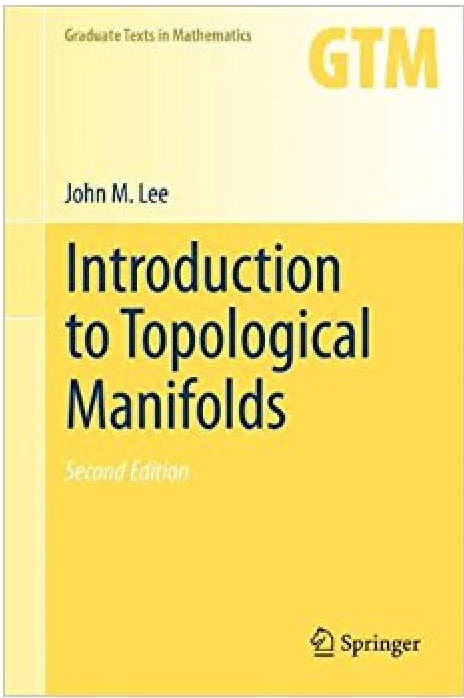
Introduction To Topological Manifolds (Graduate Texts In Mathematics)



Synopsis

This book is an introduction to manifolds at the beginning graduate level, and accessible to any student who has completed a solid undergraduate degree in mathematics. It contains the essential topological ideas that are needed for the further study of manifolds, particularly in the context of differential geometry, algebraic topology, and related fields.Although this second edition has the same basic structure as the first edition, it has been extensively revised and clarified; not a single page has been left untouched.Ã Â The major changes include a new introduction to CW complexes (replacing most of the material on simplicial complexes in Chapter 5); expanded treatments of manifolds with boundary, local compactness, group actions, and proper maps; and a new section on paracompactness.

Book Information

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Customer Reviews

From the reviews of the second edition:Ã¢â ¬Å"An excellent introduction to both point-set and algebraic topology at the early-graduate level, using manifolds as a primary source of examples and motivation. Ã¢â ¬Â¦ The author has Ã¢â ¬Â¦ fulfilled his objective of integrating a study of manifolds into an introductory course in general and algebraic topology. This text is well-organized and clearly written, with a good blend of motivational discussion and mathematical rigor. Ã¢â ¬Â¦ Any student who has gone through this book should be well-prepared to pursue the study of differential geometry Ã¢â ¬Â¦ .Ã¢â ¬Â• (Mark Hunacek, The Mathematical Association of America, March, 2011)Ã¢â ¬Å"This book is designed for first year graduate students as an introduction to the topology of manifolds. Ã¢â ¬Â¦ The book can be read with advantage by any graduate student with a good undergraduate background, and indeed by many upper class undergraduates. It can be used for self study or as a text book for a fine geometrically flavored introduction to manifolds. One which provides excellent motivation for studying the machinery needed for more advanced work.Ã¢â ¬Â• (Jonathan Hodgson, Zentralblatt MATH, Vol. 1209, 2011)

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Good first read through for anyone beginning a study of topological concepts. Anyone having trouble with the preliminary chapters might try this book in conjunction with Munkres and Ken Ross's 'Elementary Analysis.'

I used Lee's 'Introduction to Smooth Manifolds' & 'Introduction to Curvature' for a few months, and I felt like it would be a good idea to complete the collection and acquire some more knowledge about topological manifolds using this book.Overall, I think that Lee's 'Introduction to Topological Book' is an excellent book, as it is one of the few books that give both a profound intuition to the geometry of the subject, supplemented by rigorous proofs.In my opinion, the book has only two disadvantages:1) Not enough concrete examples.2) It should has covered a bit more material, such as CW complexes.All together, HIGHLY RECOMMENDED! The first chapter, giving some motivation to study manifolds is awesome!

I picked this book mainly because a friend recommended this whole series to me. While I cannot say this book would make a great introduction to point set topology (I think Munkres is still the best for that), it has all that one would want to get going with manifold theory. What I liked most about this text is probably the rigor. This text will motivate the topics and give rigorous proof to many theorems. There are also many good examples to illustrate his point. I'd recommend this book, and the follow-up text "Introduction to Smooth Manifolds" to anyone interested in graduate level mathematics. Since the two texts will likely cost you less than $100, they'll make a nice addition to your math library.

This book is a clear way to learn manifolds. In my opinion Lee is a great author with a clear knowledge of diferencial geometry. It worth to make this trip.

This is the best book on topology that I have come across so far, the material is presented in a very well ordered and structured way facilitating the learning process of each topic. For me as a physicist, was the first time that I could learn the basics of topology (chapters 2-4) in a solid way, and I’m very grateful about that. The first 4 chapters are as follow: 1-Introduction, here a nice overview of what are manifolds and where are they encounter is given, then chapter 2-4 introduced basics concepts like what is a topology, bases of topologies (what’s the purpose for using bases) the definition of topological manifolds, then are introduced the subspace topology related to subspaces, product topology for product spaces (cartesian product) and quotient topology for quotient spaces. Finally the concepts of Connectedness and Compactness are treated. These constitute the first part of the book, then chapter 5 introduces Simplicial Complexes which is a very convenient way of characterization of a space as a linear combination of points (vertices), lines, planes, solid tetrahedrons, and higher dimensional analogs which can be for instance be visualized in an Euclidean space to then be mapped to a manifold establishing a triangulation of the manifold. With these, things like the combinatorial invariant of the Euler chararcteristic can be defined and calculated for the space in question. Chapter 6 is about the simplest manifolds that exist, this is, curves and surfaces, classification theorems are proved for each one where for the case of surfaces is necessary to defined the concept of a connected sum of surfaces. chapte 7-8 treat the theory of Homotopy and the introduction of the Fundamental Group, also are given a brief account of the higher Homotopy groups for higher dimensional "loops". The fundamental group of the circle and spheres are calculated and for product of spaces. Chapter 9 gives the theory of free products and free groups (the latter being a free product as well) necessary for the Seifert-Van Kampen theorem treated in chapter 10, essentially the Seiftert-Van Kampen theorem is very important because it provides a way of computing the fundamental group of more complicated spaces which are the union of more simple ones such as the circle. I have to admit that chapters 12-13 I skip them all together, and when I started my study of the follow up to this bookÃ Â Introduction to Smooth Manifolds (Graduate Texts in Mathematics, Vol. 218)Ã Â I went directly to the appedix and learn what was needed on covering maps and covering spaces as a fact. The final chapter 13 is an introduction into Homology theory both first on the singular version and then on the simplicial version (they are isomorphic) and of Cohomology as well but very brief for the case of cohomology. I like the section on the Mayer-Vietoris sequence (Theorem) where you can find its proof and its motivation for its definition. The Mayer Vietoris sequence is like the Seifert-Van Kampen theorem in the sence that it permits you calculate the Homology and Cohomology (there is a contravariant version for cohomology) groups of more complicated spaces which can be decomposed as the union of more simple spaces whose groups are already known. I really enjoyed reading this book, and that's because it is very well written, a delight, I recommend it eyes closed.

I began learning topology beyond real analysis with this book, and I found it to be a well-balanced text. This book covers every fundamental subject one needs to know without delving too much into a particular area of topology. The book begins with general topology and becomes increasingly algebraic as one progresses. Manifolds are emphasized throughout with ample examples and exercises. The presentation is very lucid and rigorous without being too pedantic.There are more comprehensive books on topology, but this book is more apt for an introduction. I think that when one first learns about a mathematical subject, motivation is important. As a text goes deeper and deeper into the technicalities of a particular topic, the newcomer appreciates the concepts less and less and wonders where it is all leading to. This book affords just the right amount of material without causing one to reach the edge of boredom and lose sight of the bigger picture. In addition, a lot of motivation for learning the material is provided by the interspersed discussions on manifolds which are the most important topological spaces. The book prepares one for the entire field of topology in a concise manner.Basic knowledge of metric spaces and group theory is recommended. If you are learning topology for the first time, you should definitely consider this book.

Theory (Graduate Texts in Mathematics) Algebraic Graph Theory (Graduate Texts in Mathematics)