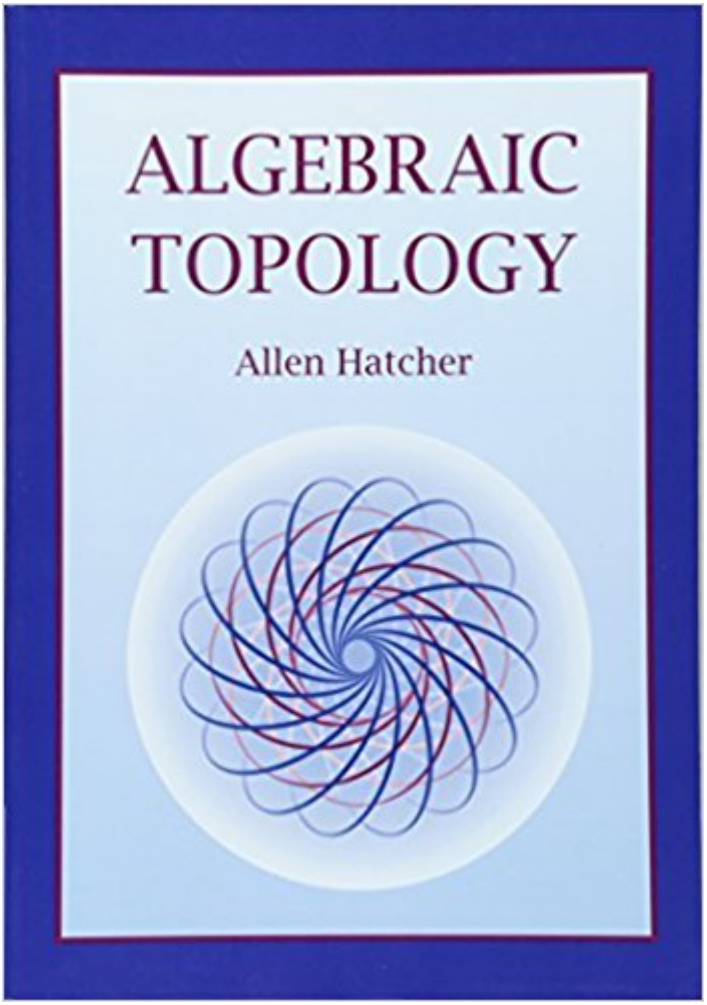
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Algebraic Topology



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Synopsis

In most major universities one of the three or four basic first-year graduate mathematics courses is algebraic topology. This introductory text is suitable for use in a course on the subject or for self-study, featuring broad coverage and a readable exposition, with many examples and exercises. The four main chapters present the basics: fundamental group and covering spaces, homology and cohomology, higher homotopy groups, and homotopy theory generally. The author emphasizes the geometric aspects of the subject, which helps students gain intuition. A unique feature is the inclusion of many optional topics not usually part of a first course due to time constraints: Bockstein and transfer homomorphisms, direct and inverse limits, H-spaces and Hopf algebras, the Brown representability theorem, the James reduced product, the Dold-Thom theorem, and Steenrod squares and powers.

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Customer Reviews

"Algebraic topoligy books that emphasize geometrical intuition usually have only a modest technical reach. Remarkably, Hatcher (Cornell Univ.) offers a highly geometrical treatment that neverheless matches the coverage of, e.g., Edwin Henry Spanier’s very formidable and identically titled classic work... He promises two advanced companion volumes, one on spectral sequences, one on vector bundles. One anticipates the combined treatise doing for algebraic topology what Michael Spivak’s magisterial five-volume set did for differential geometry." Choice

In most mathematics departments at major universities one of the three or four basic first-year graduate courses is in the subject of algebraic topology. This introductory textbook in algebraic topology is suitable for use in a course or for self-study, featuring broad coverage of the subject and a readable exposition, with many examples and exercises. The four main chapters present the basic material of the subject: fundamental group and covering spaces, homology and cohomology, higher homotopy groups, and homotopy theory generally. A unique feature of the book is the inclusion of many optional topics for which elementary expositions are hard to find. Researchers and students alike will welcome this aspect of the book.

As many others have explained, this book has an informal style in defining new concepts and its proofs. This lack of rigor can be very annoying if you are used to learning mathematics through clear cut definitions and rigorous proofs. I am in this category and didn't find it very helpful and eventually stopped reading it and continued with Bredon's book which i totally recommend as your first book on this topic. However i think hatcher's book is by far the best one among others, in terms of exercises, examples and figures. Therefore it can be very helpful when you have learned the formal defs and proofs and want to apply it and solve some problems.

Over time, I have warmed a bit to Hatcher's book, especially after adapting to the style. Hatcher gives a comprehensive book which has been neatly organized into sections. Once you know what you're doing, it's actually fairly easy to find what you want in Hatcher, but reading it for the first time can be a real pain. I find the introductory chapter on basic constructions particularly lacking: given the focus on CW complexes, a more thorough treatment is merited rather than having it shoved back into the appendix. The verbose style also makes it very difficult to quickly identify the main ideas without necessarily reading all of the fluff. In particular, key definitions are often buried in the middle of paragraphs and are hard to refer back to. While proofs are often elegant, Hatcher has an annoying habit of inserting lengthy technical results between the statement of a theorem and its proof so that by the time you get to the actual proof, you've forgotten the precise statement of the theorem and have to keep flipping back and forth.

If you are like me, you live for those moments when studying a book when you read a sentence, and your eyes shoot open and you suddenly feel like the author has been watching you from somewhere just over your shoulder. There are lots of those kinds of sentences in this book, and figures too. On the other hand, the text is demanding, and not always clear. Hatcher will (generally

speaking) lead you up to the point at which you can finish excavating his logic; at times his definitions are infuriatingly "pretty" and vague, and you will have to check other sources. Depending on the way you like to do things, you may get frustrated. A pity because there is so much valuable material in the book. I know of two other books, Algebraic Topology by Munkres, and Topology and Geometry by Glen Bredon, that I find helpful and not as vague as Hatcher. Each one is impressive, and each has pros and cons.

I hate it at first, because it is not quite clearly stated as Munkres. But I learn this subject more, I think it is quite well constructed compare to Munkres, which makes the calculation and proof more concise. Although it is very hard to understand all these things at first, you will fall in love it once you find out all the pain pay off.

The more and more algebraic topology that I learn the more I continue to come back to Hatcher for motivation and examples. This book is worth its weight in gold just for all the examples both throughout the text and in the exercises. Another reviewer has said it: "You will not regret buying this book".

Hatcher seems to have become the standard text for algebraic topology. The book has great examples and many more illustrations than any other book I've seen on the subject. However, I sometimes feel that Hatcher rushes through results, especially in the section on covering spaces. I also have Rotman's topology text and I prefer Rotman's methodical style.

Hatcher's Algebraic Topology is a surprisingly readable textbook. Although others have commented that Hatcher is insufficiently rigorous or precise, I actually enjoy that aspect of his writing; he seems to know when to write a lot of math and when a pretty picture will suffice. I also like the informal way that new terms are interspersed into the text rather than set aside per usual in math texts.Only thing is, this book is available freely (and legally!) via Hatcher's website in .pdf form. You could go to Kinko's and get the whole thing bound for $10, or, even better, just print out the sections you'll need. Which makes the $30 price on less attractive than it might seem. Just FYI.

If you are new to the area of algebraic topology, stay away from this book. If you had enough experience this would be an insightful handbook (storybook).For beginners especially those who are serious about line-to-line rigorousness and clarity in definitions. This is not the book for you. To

some extent, it may discourages you from the learning subject, especially if you are reading it on your own without a professor guiding you out of the labyrinth. For a beginner, the most important thing is to have a rigorous understanding of the basic definitions, the nuances in defintions and rigorous derivation upon these definitions. However, the geometrically intuitive flavor of hatcher's presentation should be reserved for "those experienced hikers who revisit the site at a second time" and who want to explore more places than their first visit. Hatcher does a good job for them, but for beginners, you shall just read the books, for instance, by Munkres which is much clearer than the murky conversation of Hatcher.Unfortunately, this book is often recommended to beginners by those who are more experienced. To them, Hatcher's book of course gives a more matured discussion. But it is really overrated as an introductory text.To be honest, this book, of course, deserves more than one star. But I hope to raise the awareness and let beginners have a better experience with algebraic topology without succumbing to the "peer pressure". It is ok to find this book confusing and frustrating if you are a beginner. It does not mean you are not good at it, or you are simply 'not smart' as those arrogant experienced guys. It just means this book is not a good introduction for beginners.After learning the basics from the two Munkres book, THEN return to Hatcher.

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