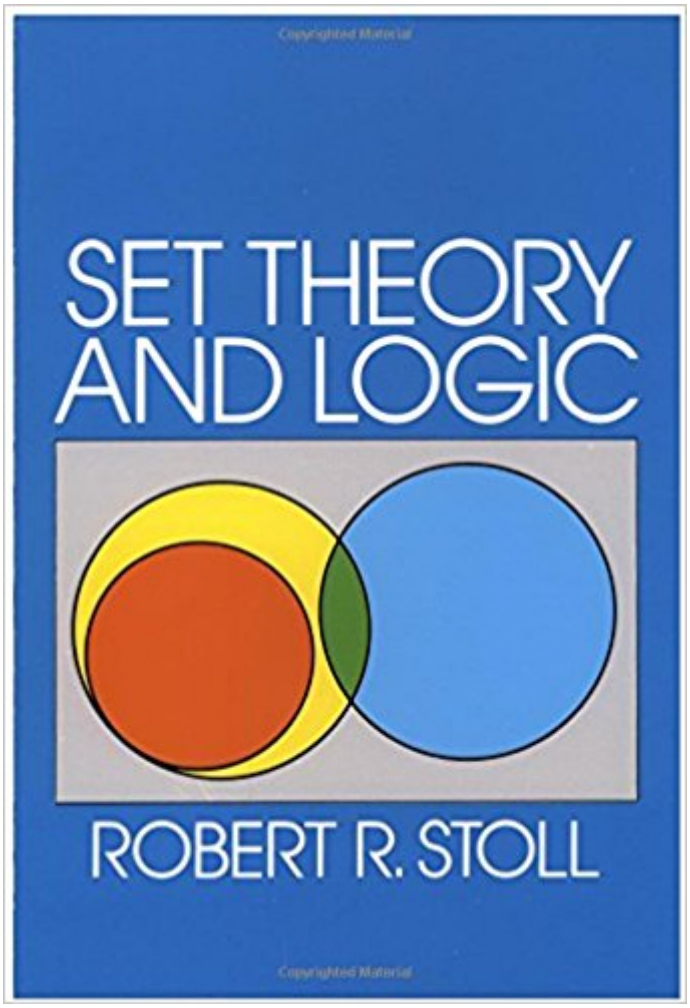
Set Theory And Logic (Dover Books On Mathematics)



Synopsis

Set Theory and Logic is the result of a course of lectures for advanced undergraduates, developed at Oberlin College for the purpose of introducing students to the conceptual foundations of mathematics. Mathematics, specifically the real number system, is approached as a unity whose operations can be logically ordered through axioms. One of the most complex and essential of modern mathematical innovations, the theory of sets (crucial to quantum mechanics and other sciences), is introduced in a most careful concept manner, aiming for the maximum in clarity and stimulation for further study in set logic.Contents include: Sets and Relations â ” Cantor’s concept of a set, etc.Natural Number Sequence â ” Zorn’s Lemma, etc.Extension of Natural Numbers to Real NumbersLogic â ” the Statement and Predicate Calculus, etc.Informal Axiomatic MathematicsBoolean AlgebraInformal Axiomatic Set TheorySeveral Algebraic Theories â ” Rings, Integral Domains, Fields, etc.First-Order Theories â ” Metamathematics, etc.Symbolic logic does not figure significantly until the final chapter. The main theme of the book is mathematics as a system seen through the elaboration of real numbers; set theory and logic are seen s efficient tools in constructing axioms necessary to the system.Mathematics students at the undergraduate level, and those who seek a rigorous but not unnecessarily technical introduction to mathematical concepts, will welcome the return to print of this most lucid work."Professor Stoll . . . has given us one of the best introductory texts we have seen." â ” Cosmos."In the reviewer’s opinion, this is an excellent book, and in addition to its use as a textbook (it contains a wealth of exercises and examples) can be recommended to all who wish an introduction to mathematical logic less technical than standard treatises (to which it can also serve as preliminary reading)." â ” Mathematical Reviews.

Book Information

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Customer Reviews

This book is without peer in its breadth of coverage of the foundations of mathematics and logic. I have given this book only 4 stars, because its treatment of any given topicis not classic. It is the total package that astounds.For a mere $15, you get a challenging undergraduate introduction to all of the following topics. I have written in parentheses the names of authors of more definitive treatments:Intuitive set theory through the axiom of choice (Halmos)Natural numbers ÃƒÂ† Integers ÃƒÂ† Rationals ÃƒÂ† Reals (Feferman)Mathematical logic (Machover, Smullyan)Metamathetics (Machover, Mendelson)Introduction to the axiomatic approachZF axiomatic set theory (Suppes)Boolean algebra through Stone's theorem and the completeness of sentential logic (Halmos & Givant)Algebra (Birkhoff & MacLane's "Algebra")Stoll's style is quite discursive, far from the terse lemma-theorem-corollary-remark style of so much 20th century mathematics. My only major disappointment is that the formal proof technique set out in chpt. 4 is natural deduction rather than the tableau method or Quine's Main Method.It is indeed the case that there are no solutions to the exercises, but I do not believe that that is a major flaw.

This book is a great bargain: intuitive and axiomatic set theory, foundations of number systems, first order logic and its completeness and undecidability, the basics of abstract algebra, especially Boolean algebra (through the Stone theorem), elementary group theory, and Godelian incompletability. All in one inexpensive paperback. Excellent coverage of the three way crossroads where logic, modern algebra, and metamathematics intersect. Often the first reference I consult on basic logic.Even though I am not a mathematician, I can understand, with effort, most of what the author is trying to say.

This book is very well written and easy to understand. However, it has a very serious shortcoming: there are no solutions to the exercises. If you're looking for a basic reference, this book is good, but if you want a book you can use to learn set theory and logic, get one that has solutions to the exercises.

If you are already familiar with the material, this book is a concise and clear reference, and yes a

great buy. But for learning these topics from the beginning, you would be better served by other books that are focused on just a particular topic.For example, for logic in the context of set theory, I highly recommend Daniel Velleman’s How to Prove it.

It is really more about foundational issues than sets and logic. The preface says this was intended as a one-year course in the foundations of math for upper division math majors. The delivery is slow and gentle, rather wordy, and a bit stodgy -- not always crystal clear about what point he is making. It is suitable for students who have no experience with higher math. I don’t know about students at the author’s school, but I think it would try the patience of most seniors or grad students in math. I would recommend it more to lower division and philosophy majors.

Boring, loaded with gratuitous proofs of trivial theorems. In fact, the clumsily written proofs take up around 85% of the book, and they do nothing to illuminate the theorems in question. Moreover, the proofs are unintelligible except to those who can produce their own proofs of the theorems in question. The approach is narrow and pedantic. That said, this book has two saving graces. First, it does cover more or less everything, if only in its oafish and blinkered way. Second, the material on algebra is clear and concise. But even the material on algebra is inadequate. It is not explained why the concept of a ring- is of philosophical or scientific significance. In fact, nothing in this book is explained. Where there should be explanations, there are labored proofs, the result being a wooden tome which is unintelligible to neophytes and of limited use to experts.

This is an easy to follow treatise on set theory. It is written in a simple style that any can follow and it is a very good and complete account of the whole theory. The last chapters are particularly as the topics in them show how the theory is used in conventional mathematics. The very last chapter is an introduction to more advanced subjects that skirt model theory and talk about the standard mathematical logic topics like consistency, completeness, and categorical of first order theories; decidable theories, and GÃ¶del’s theorem.The book has been around for ages, and I’m on my second copy as the first has been literally worn out through continual use as a reference.

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