Language Proof And Logic 2nd Edition

Logics of Time and ComputationBook of ProofMeaning and ArgumentIntroduction to Mathematical ProofsFormal Semantics and LogicLogic for Computer ScienceEssentials of LogicLogicMathematical ReasoningStructural Proof TheoryLogic in Computer ScienceHow to Prove ItLogical Reasoning with Diagrams & SentencesFormal LogicA Friendly Introduction to Mathematical LogicLogic for MathematiciansMathematical LogicBasic Proof TheoryThe Victorious AttitudePrincipia MathematicaA Concise Introduction to LogicModern LogicHyperproofMathematical Analysis and ProofAn Introduction to Gödel's TheoremsLambda-Calculus and CombinatorsLogic for Computer ScienceLanguage, Truth and LogicIntroduction to the Theory of ComputationGraph Structure and Monadic Second-Order LogicLanguage, Proof, and LogicModal Logic for PhilosophersFirst Course in Mathematical LogicSymbolic LogicEuclid's ElementsProofs from THE BOOKAn Introduction to Formal LogicPhilosophies of MathematicsAn Introduction to Mathematical Logic and Type TheoryTarski's World

Logics of Time and Computation

According to the great mathematician Paul

Erdös, God maintains perfect mathematical proofs in The Book. This book presents the authors candidates for such "perfect proofs," those which contain brilliant ideas, clever connections, and wonderful observations, bringing new insight and surprising perspectives to problems from number theory, geometry, analysis, combinatorics, and graph theory. As a result, this book will be fun reading for anyone with an interest in mathematics.

Book of Proof

This 2006 book provides an accessible, yet technically sound treatment of modal logic and its philosophical applications.

Meaning and Argument

Recent years have seen the development of powerful tools for verifying hardware and software systems, as companies worldwide realise the need for improved means of validating their products. There is increasing demand for training in basic methods in formal reasoning so that students can gain proficiency in logic-based verification methods. The second edition of this successful textbook addresses both those requirements, by continuing to provide a clear introduction to formal reasoning which is both relevant to the needs of modern

computer science and rigorous enough for practical application. Improvements to the first edition have been made throughout, with extra and expanded sections on SAT solvers, existential/universal second-order logic, micro-models, programming by contract and total correctness. The coverage of model-checking has been substantially updated. Further exercises have been added. Internet support for the book includes worked solutions for all exercises for teachers, and model solutions to some exercises for students.

Introduction to Mathematical Proofs

Shows How to Read & Write Mathematical Proofs Ideal Foundation for More Advanced Mathematics Courses Introduction to Mathematical Proofs: A Transition facilitates a smooth transition from courses designed to develop computational skills and problem solving abilities to courses that emphasize theorem proving. It helps students develop the skills necessary to write clear, correct, and concise proofs. Unlike similar textbooks, this one begins with logic since it is the underlying language of mathematics and the basis of reasoned arguments. The text then discusses deductive mathematical systems and the systems of natural numbers, integers, rational numbers, and real numbers. It also covers elementary topics in set theory,

explores various properties of relations and functions, and proves several theorems using induction. The final chapters introduce the concept of cardinalities of sets and the concepts and proofs of real analysis and group theory. In the appendix, the author includes some basic guidelines to follow when writing proofs. Written in a conversational style, yet maintaining the proper level of mathematical rigor, this accessible book teaches students to reason logically, read proofs critically, and write valid mathematical proofs. It will prepare them to succeed in more advanced mathematics courses, such as abstract algebra and geometry.

Formal Semantics and Logic

Many students have trouble the first time they take a mathematics course in which proofs play a significant role. This new edition of Velleman's successful text will prepare students to make the transition from solving problems to proving theorems by teaching them the techniques needed to read and write proofs. The book begins with the basic concepts of logic and set theory, to familiarize students with the language of mathematics and how it is interpreted. These concepts are used as the basis for a step-by-step breakdown of the most important techniques used in constructing proofs. The author shows how complex proofs are built up

from these smaller steps, using detailed 'scratch work' sections to expose the machinery of proofs about the natural numbers, relations, functions, and infinite sets. To give students the opportunity to construct their own proofs, this new edition contains over 200 new exercises, selected solutions, and an introduction to Proof Designer software. No background beyond standard high school mathematics is assumed. This book will be useful to anyone interested in logic and proofs: computer scientists, philosophers, linguists, and of course mathematicians.

Logic for Computer Science

Rev. ed. of: Language, proof, and logic / Jon Barwise & John Etchemendy.

Essentials of Logic

Mathematical Reasoning: Writing and Proof is a text for the ?rst college mathematics course that introduces students to the processes of constructing and writing proofs and focuses on the formal development of mathematics. The primary goals of the text are to help students: Develop logical thinking skills and to develop the ability to think more abstractly in a proof oriented setting; develop the ability to construct and write mathematical proofs using standard

methods of mathematical proof including direct proofs, proof by contradiction, mathematical induction, case analysis, and counterexamples; develop the ability to read and understand written mathematical proofs; develop talents for creative thinking and problem solving; improve their quality of communication in mathematics. This includes improving writing techniques, reading comprehension, and oral communication in mathematics; better understand the nature of mathematics and its language. Another important goal of this text is to provide students with material that will be needed for their further study of mathematics. Important features of the book include: Emphasis on writing in mathematics; instruction in the process of constructing proofs; emphasis on active learning.There are no changes in content between Version 2.0 and previous versions of the book. The only change is that the appendix with answers and hints for selected exercises now contains solutions and hints for more exercises.

Logic

The Hyperproof courseware package teaches the principles of analytical reasoning and proof construction using a carefully crafted combination of a textbook, desktop applications and online materials. Unlike traditional formal treatments of reasoning,

the Hyperproof approach uses both graphical and sentential representations of information. This reflects common situations in everyday reasoning which involve information expressed in many forms, such as finding your way to a location using a map and an address, or interpreting a newspaper story involving both text and a graphic. Using Hyperproof the student learns to construct proofs of both consequence and non-consequence using an intuitive proof system which extends standard treatments of proof with sentential, graphical and heterogeneous inference rules. The approach allows students to focus on the content of proofs, rather than on the syntactic structure of formal sentences. Proofs of consistency and inconsistency as well as independence proofs may also be constructed in the system. The desktop application can be used to check the logical validity of all of the different types of proof. The Hyperproof courseware package contains more than 300 exercises, of which more than 250 can assessed by the Grade Grinder online assessment service. The courseware is supported by an extensive web site through which students and instructors can access online video lectures by the authors. Instructors also have the ability to create their own exercises for assessment and access to assessments of the work submitted by their students. Hyperproof builds on the Tarski s World and Language, Proof and Logic courseware packages from the same authors.

The material in these packages can be combined to create a variety of different courses, or incorporate as engaging components of courses that teach logical reasoning, including formal linguistics, philosophy, mathematics, and computer science. "

Mathematical Reasoning

This introduction to first-order logic clearly works out the role of first-order logic in the foundations of mathematics, particularly the two basic questions of the range of the axiomatic method and of theorem-proving by machines. It covers several advanced topics not commonly treated in introductory texts, such as Fraïssé's characterization of elementary equivalence, Lindström's theorem on the maximality of first-order logic, and the fundamentals of logic programming.

Structural Proof Theory

Tens of thousands of students have learned to be more discerning at constructing and evaluating arguments with the help of Patrick J. Hurley. Hurley’s lucid, friendly, yet thorough presentation has made A CONCISE INTRODUCTION TO LOGIC the most widely used logic text in North America. In addition, the book’s accompanying technological resources,

such as CengageNOW and Learning Logic, include interactive exercises as well as video and audio clips to reinforce what you read in the book and hear in class. In short, you'll have all the assistance you need to become a more logical thinker and communicator. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Logic in Computer Science

"Intended as an upper-level undergraduate or introductory graduate text in computer science theory," this book lucidly covers the key concepts and theorems of the theory of computation. The presentation is remarkably clear; for example, the "proof idea," which offers the reader an intuitive feel for how the proof was constructed, accompanies many of the theorems and a proof. Introduction to the Theory of Computation covers the usual topics for this type of text plus it features a solid section on complexity theory--including an entire chapter on space complexity. The final chapter introduces more advanced topics, such as the discussion of complexity classes associated with probabilistic algorithms.

How to Prove It

Brimming with visual examples of concepts, derivation rules, and proof strategies, this introductory text is ideal for students with no previous experience in logic. Students will learn translation both from formal language into English and from English into formal language; how to use truth trees and truth tables to test propositions for logical properties; and how to construct and strategically use derivation rules in proofs.

Logical Reasoning with Diagrams & Sentences

The study of graph structure has advanced in recent years with great strides: finite graphs can be described algebraically, enabling them to be constructed out of more basic elements. Separately the properties of graphs can be studied in a logical language called monadic second-order logic. In this book, these two features of graph structure are brought together for the first time in a presentation that unifies and synthesizes research over the last 25 years. The authors not only provide a thorough description of the theory, but also detail its applications, on the one hand to the construction of graph algorithms, and, on the other to the extension of formal language theory to finite graphs. Consequently the book will be of interest to graduate students and researchers in graph theory, finite model theory, formal

language theory, and complexity theory.

Formal Logic

An understanding of logic is essential to computer science. This book provides a highly accessible account of the logical basis required for reasoning about computer programs and applying logic in fields like artificial intelligence. The text contains extended examples, algorithms, and programs written in Standard ML and Prolog. No prior knowledge of either language is required. The book contains a clear account of classical first-order logic, one of the basic tools for program verification, as well as an introductory survey of modal and temporal logics and possible world semantics. An introduction to intuitionistic logic as a basis for an important style of program specification is also featured in the book.

A Friendly Introduction to Mathematical Logic

The classic Heath translation, in a completely new layout with plenty of space and generous margins. An affordable but sturdy student and teacher sewn softcover edition in one volume, with minimal notes and a new index/glossary.

Logic for Mathematicians

Peter Smith examines Gödel's Theorems, how they were established and why they matter.

Mathematical Logic

Provides an essential introduction to classical logic.

Basic Proof Theory

Accompanying CD-ROM contains "software for both Windows and Macintosh operating systems."--Page 4 of cover.

The Victorious Attitude

At the intersection of mathematics, computer science, and philosophy, mathematical logic examines the power and limitations of formal mathematical thinking. In this expansion of Leary's user-friendly 1st edition, readers with no previous study in the field are introduced to the basics of model theory, proof theory, and computability theory. The text is designed to be used either in an upper division undergraduate classroom, or for self study. Updating the 1st Edition's treatment of languages, structures, and deductions, leading to rigorous proofs of Godel's First and Second Incompleteness Theorems, the expanded 2nd Edition includes a new introduction to incompleteness through computability as well as solutions to

selected exercises.

Principia Mathematica

This book provides an accessible, critical introduction to the three main approaches that dominated work in the philosophy of mathematics during the twentieth century: logicism, intuitionism and formalism.

A Concise Introduction to Logic

Formal logic provides us with a powerful set of techniques for criticizing some arguments and showing others to be valid. These techniques are relevant to all of us with an interest in being skilful and accurate reasoners. In this highly accessible book, Peter Smith presents a guide to the fundamental aims and basic elements of formal logic. He introduces the reader to the languages of propositional and predicate logic, and then develops formal systems for evaluating arguments translated into these languages, concentrating on the easily comprehensible 'tree' method. His discussion is richly illustrated with worked examples and exercises. A distinctive feature is that, alongside the formal work, there is illuminating philosophical commentary. This book will make an ideal text for a first logic course, and will provide a firm basis for further work in formal and philosophical

logic.

Modern Logic

This book is an introduction to the language and standard proof methods of mathematics. It is a bridge from the computational courses (such as calculus or differential equations) that students typically encounter in their first year of college to a more abstract outlook. It lays a foundation for more theoretical courses such as topology, analysis and abstract algebra. Although it may be more meaningful to the student who has had some calculus, there is really no prerequisite other than a measure of mathematical maturity.

Hyperproof

Mathematical Analysis and Proof

"A delightful book … I should like to have written it myself." — Bertrand Russell First published in 1936, this first full-length presentation in English of the Logical Positivism of Carnap, Neurath, and others has gone through many printings to become a classic of thought and communication. It not only surveys one of the most important areas of modern thought; it also shows the confusion that arises from imperfect

understanding of the uses of language. A first-rate antidote for fuzzy thought and muddled writing, this remarkable book has helped philosophers, writers, speakers, teachers, students, and general readers alike. Mr. Ayers sets up specific tests by which you can easily evaluate statements of ideas. You will also learn how to distinguish ideas that cannot be verified by experience — those expressing religious, moral, or aesthetic experience, those expounding theological or metaphysical doctrine, and those dealing with a priori truth. The basic thesis of this work is that philosophy should not squander its energies upon the unknowable, but should perform its proper function in criticism and analysis.

An Introduction to Gödel's Theorems

Combinatory logic and lambda-calculus, originally devised in the 1920's, have since developed into linguistic tools, especially useful in programming languages. The authors' previous book served as the main reference for introductory courses on lambda-calculus for over 20 years: this long-awaited new version is thoroughly revised and offers a fully up-to-date account of the subject, with the same authoritative exposition. The grammar and basic properties of both combinatory logic and lambda-calculus are discussed, followed by an introduction to

type-theory. Typed and untyped versions of the systems, and their differences, are covered. Lambda-calculus models, which lie behind much of the semantics of programming languages, are also explained in depth. The treatment is as non-technical as possible, with the main ideas emphasized and illustrated by examples. Many exercises are included, from routine to advanced, with solutions to most at the end of the book.

Lambda-Calculus and Combinators

Logic for Computer Science

Hyperproof is a system for learning the principles of analytical reasoning and proof construction, consisting of a text and a Macintosh software program. Unlike traditional treatments of first-order logic, Hyperproof combines graphical and sentential information, presenting a set of logical rules for integrating these different forms of information. This strategy allows students to focus on the information content of proofs, rather than the syntactic structure of sentences. Using Hyperproof the student learns to construct proofs of both consequence and nonconsequence using an intuitive proof system that extends the standard set of sentential rules to incorporate information represented

graphically. Hyperproof is compatible with various natural-deduction-style proof systems, including the system used in the authors' Language of First-Order Logic.

Language, Truth and Logic

This advanced text for undergraduate and graduate students introduces mathematical logic with an emphasis on proof theory and procedures for algorithmic construction of formal proofs. The self-contained treatment is also useful for computer scientists and mathematically inclined readers interested in the formalization of proofs and basics of automatic theorem proving. Topics include propositional logic and its resolution, first-order logic, Gentzen's cut elimination theorem and applications, and Gentzen's sharpened Hauptsatz and Herbrand's theorem. Additional subjects include resolution in first-order logic; SLD-resolution, logic programming, and the foundations of PROLOG; and many-sorted first-order logic. Numerous problems appear throughout the book, and two Appendixes provide practical background information.

Introduction to the Theory of Computation

Modern Logic fills the strong need for a highly accessible, carefully structured

introductory text in symbolic logic. The natural deduction system Forbes uses will be easy for students to understand, and the material is carefully structured, with graded exercises at the end of each section, selected answers to which are provided at the back of the book. The book's emphasis is on giving the student a thorough understanding of the concepts rather than just a facilitywith formal procedures.

Graph Structure and Monadic Second-Order Logic

Language, Proof, and Logic

A concise introduction to structural proof theory, a branch of logic studying the general structure of logical and mathematical proofs.

Modal Logic for Philosophers

Meaning and Argument is a popular introduction to philosophy of logic and philosophy of language. Offers a distinctive philosophical, rather than mathematical, approach to logic Concentrates on symbolization and works out all the technical logic with truth tables instead of derivations Incorporates the insights of half a century's work in philosophy and

linguistics on anaphora by Peter Geach, Gareth Evans, Hans Kamp, and Irene Heim among others Contains numerous exercises and a corresponding answer key An extensive appendix allows readers to explore subjects that go beyond what is usually covered in an introductory logic course Updated edition includes over a dozen new problem sets and revisions throughout Features an accompanying website at http://ruccs.rutgers.edu/~logic/MeaningArgument.html

First Course in Mathematical Logic

Formal Logic is an undergraduate text suitable for introductory, intermediate, and advanced courses in symbolic logic. The book's nine chapters offer thorough coverage of truth-functional and quantificational logic, as well as the basics of more advanced topics such as set theory and modal logic. Complex ideas are explained in plain language that doesn't presuppose any background in logic or mathematics, and derivation strategies are illustrated with numerous examples. Translations, tables, trees, natural deduction, and simple meta-proofs are taught through over 400 exercises. A companion website offers supplemental practice software and tutorial videos.

Symbolic Logic

Sets out the basic theory of normal modal and temporal propositional logics; applies this theory to logics of discrete (integer), dense (rational), and continuous (real) time, to the temporal logic of henceforth, next, and until, and to the propositional dynamic logic of regular programs.

Euclid's Elements

Introduction to proof theory and its applications in mathematical logic, theoretical computer science and artificial intelligence.

Proofs from THE BOOK

In Logic for Mathematicians, author Hamilton introduces the reader to the techniques and principle results of mathematical logic.

An Introduction to Formal Logic

Rigorous introduction is simple enough in presentation and context for wide range of students. Symbolizing sentences; logical inference; truth and validity; truth tables; terms, predicates, universal quantifiers; universal specification and laws of identity; more.

Philosophies of Mathematics

Rendered from the 11th Edition of Copi/Cohen, Introduction to Logic, the most respected introductory logic book on the market, this concise version presents a simplified yet rigorous introduction to the study of logic. It covers all major topics and approaches, using a three-part organization that outlines specific topics under logic and language, deduction, and induction. For individuals intrigued by the formal study of logic.

An Introduction to Mathematical Logic and Type Theory

This fundamental and straightforward text addresses a weakness observed among present-day students, namely a lack of familiarity with formal proof. Beginning with the idea of mathematical proof and the need for it, associated technical and logical skills are developed with care and then brought to bear on the core material of analysis in such a lucid presentation that the development reads naturally and in a straightforward progression. Retaining the core text, the second edition has additional worked examples which users have indicated a need for, in addition to more emphasis on how analysis can be used to tell the accuracy of the approximations to the quantities of interest which arise in analytical limits. Addresses a lack of familiarity with formal proof, a weakness observed among present-day

mathematics students Examines the idea of mathematical proof, the need for it and the technical and logical skills required

Tarski's World

In case you are considering to adopt this book for courses with over 50 students, please contact ties.nijssen@springer.com for more information. This introduction to mathematical logic starts with propositional calculus and first-order logic. Topics covered include syntax, semantics, soundness, completeness, independence, normal forms, vertical paths through negation normal formulas, compactness, Smullyan's Unifying Principle, natural deduction, cut-elimination, semantic tableaux, Skolemization, Herbrand's Theorem, unification, duality, interpolation, and definability. The last three chapters of the book provide an introduction to type theory (higher-order logic). It is shown how various mathematical concepts can be formalized in this very expressive formal language. This expressive notation facilitates proofs of the classical incompleteness and undecidability theorems which are very elegant and easy to understand. The discussion of semantics makes clear the important distinction between standard and nonstandard models which is so important in understanding puzzling phenomena such as the incompleteness theorems and

Skolem's Paradox about countable models of set theory. Some of the numerous exercises require giving formal proofs. A computer program called ETPS which is available from the web facilitates doing and checking such exercises. Audience: This volume will be of interest to mathematicians, computer scientists, and philosophers in universities, as well as to computer scientists in industry who wish to use higher-order logic for hardware and software specification and verification.

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