

Mathematical Structures For Computer Science

Mathematics of Discrete Structures for Computer Science
 Computer Science Distilled
 Foundation Mathematics for Computer Science
 Discrete Mathematical Structures with Applications to Computer Science
 Introduction To Algorithms
 Applied Discrete Structures
 Fundamentals of Discrete Math for Computer Science
 Discrete Mathematical Stru
 Mathematics for Computer Science
 Mathematical Structures for Computer Science
 Discrete Structures, Logic, and Computability
 DISCRETE MATHEMATICAL STRUCTURES
 Introduction · to Mathematical Structures and · Proofs
 Mathematical Structures Of Quantum Mechanics
 Discrete Mathematical Structures
 Discrete Mathematics for Computer Science
 Discrete Mathematics for Computer Science
 Connecting Discrete Mathematics and Computer Science
 Discrete Mathematical Structures for Computer Science
 Theorem Proving in Higher Order Logics
 Lessons in Enumerative Combinatorics
 Practical Discrete Mathematics
 Mathematical Structures for Computer Science
 Concrete Mathematics
 Discrete Mathematics
 Discrete Structures
 Discrete Mathematical Structures for Computer Scientists and Engineers
 Discrete Mathematical Algorithm, and Data Structures
 Elements of discrete mathematical structures in computer science
 Discrete Mathematics for Computer Scientists
 Elementary Overview Of Mathematical Structures, An: Algebra, Topology And Categories
 Discrete Mathematical Structures for Computer Science
 Discrete Mathematical Structures
 Discrete Mathematical Structures with Applications to Computer Science
 Discrete Mathematical Structures
 Discrete Mathematical Structures for Computer Science
 Discrete Mathematical Structures, 1/e
 A Textbook of Discrete Mathematics, 9th Edition
 Elements Of Discrete Mathematics 2/E

Mathematical Structures For Computer Science

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Mathematics of Discrete Structures for Computer Science Macmillan

This book covers elementary discrete mathematics for computer science and engineering. It emphasizes mathematical definitions and proofs as well as applicable methods. Topics include formal logic notation, proof methods; induction, well-ordering; sets, relations; elementary graph theory; integer congruences; asymptotic notation and growth of functions; permutations and combinations, counting principles; discrete probability. Further selected topics may also be covered, such as recursive definition and structural induction; state machines and invariants; recurrences; generating functions.

Computer Science Distilled CRC Press

A walkthrough of computer science concepts you must know. Designed for readers who don't care for academic formalities, it's a fast and easy computer science guide. It teaches the foundations you need to program computers effectively. After a simple introduction to discrete math, it presents common algorithms and data structures. It also outlines the principles that make computers and programming languages work.

Foundation Mathematics for Computer Science World Scientific Publishing Company

This book introduces the mathematics that supports advanced computer programming and the analysis of algorithms. The primary aim of its well-known authors is to provide a solid and relevant base of mathematical skills - the skills needed to solve complex problems, to evaluate horrendous sums, and to discover subtle patterns in data. It is an indispensable text and reference not only for computer scientists - the authors themselves rely heavily on it! - but for serious users of mathematics in virtually every discipline. Concrete Mathematics is a blending of Continuous and Discrete mathematics. "More concretely," the authors explain, "it is the controlled manipulation of mathematical formulas, using a collection of techniques for solving problems." The subject matter is primarily an expansion of the Mathematical Preliminaries section in Knuth's classic Art of Computer Programming, but the style of presentation is more leisurely, and individual topics are covered more deeply. Several new topics have been added, and the most significant ideas have been traced to their historical roots. The book includes more than 500 exercises, divided into six categories. Complete answers are provided for all exercises, except research problems, making the book particularly valuable for self-study. Major topics include: Sums Recurrences Integer functions Elementary number theory Binomial coefficients Generating functions Discrete probability Asymptotic methods This second edition includes important new material about mechanical summation. In response to the widespread use of the first edition as a reference book, the bibliography and index have also been expanded, and additional nontrivial improvements can be found on almost every page. Readers will appreciate the informal style of Concrete Mathematics. Particularly enjoyable are the marginal graffiti contributed by students who have taken courses based on this material. The authors want to convey not only the importance of the techniques presented, but some of the fun in learning and using them.

Discrete Mathematical Structures with Applications to Computer Science Alpha Science International, Limited

This is a textbook for a one-term course whose goal is to ease the transition from lower-division calculus courses to upper-division courses in linear and abstract algebra, real and complex analysis, number theory, topology, combinatorics, and so on. Without such a "bridge" course, most upper division instructors feel the need to start their courses with the rudiments of logic, set theory, equivalence relations, and other basic mathematical raw materials before getting on with the subject at hand. Students who are new to higher mathematics are often startled to discover that mathematics is a subject of ideas, and not just formulaic rituals, and that they are now expected to

understand and create mathematical proofs. Mastery of an assortment of technical tricks may have carried the students through calculus, but it is no longer a guarantee of academic success. Students need experience in working with abstract ideas at a nontrivial level if they are to achieve the sophisticated blend of knowledge, discipline, and creativity that we call "mathematical maturity." I don't believe that "theorem-proving" can be taught any more than "question-answering" can be taught. Nevertheless, I have found that it is possible to guide students gently into the process of mathematical proof in such a way that they become comfortable with the experience and begin asking them selves questions that will lead them in the right direction.

Introduction To Algorithms Lulu.com

Stein/Drysdale/Bogart's Discrete Mathematics for Computer Scientists is ideal for computer science students taking the discrete math course. Written specifically for computer science students, this unique textbook directly addresses their needs by providing a foundation in discrete math while using motivating, relevant CS applications. This text takes an active-learning approach where activities are presented as exercises and the material is then fleshed out through explanations and extensions of the exercises.

Applied Discrete Structures Addison-Wesley Professional

Teaches students the mathematical foundations of computer science, including logic, Boolean algebra, basic graph theory, finite state machines, grammars and algorithms, and helps them understand mathematical reasoning for reading, comprehension and construction of mathematical arguments.

Fundamentals of Discrete Math for Computer Science Course Technology Ptr

This textbook provides an engaging and motivational introduction to traditional topics in discrete mathematics, in a manner specifically designed to appeal to computer science students. The text empowers students to think critically, to be effective problem solvers, to integrate theory and practice, and to recognize the importance of abstraction. Clearly structured and interactive in nature, the book presents detailed walkthroughs of several algorithms, stimulating a conversation with the reader through informal commentary and provocative questions. Features: no university-level background in mathematics required; ideally structured for classroom-use and self-study, with modular chapters following ACM curriculum recommendations; describes mathematical processes in an algorithmic manner; contains examples and exercises throughout the text, and highlights the most important concepts in each section; selects examples that demonstrate a practical use for the concept in question.

Discrete Mathematical Stru PHI Learning Pvt. Ltd.

"In writing this book, care was taken to use language and examples that gradually wean students from a simpleminded mechanical approach and move them toward mathematical maturity. We also recognize that many students who hesitate to ask for help from an instructor need a readable text, and we have tried to anticipate the questions that go unasked. The wide range of examples in the text are meant to augment the "favorite examples" that most instructors have for teaching the topics in discrete mathematics. To provide diagnostic help and encouragement, we have included solutions and/or hints to the odd-numbered exercises. These solutions include detailed answers whenever warranted and complete proofs, not just terse outlines of proofs. Our use of standard terminology and notation makes Applied Discrete Structures a valuable reference book for future courses. Although many advanced books have a short review of elementary topics, they cannot be complete. The text is divided into lecture-length sections, facilitating the organization of an instructor's presentation. Topics are presented in such a way that students' understanding can be monitored through thought-provoking exercises. The exercises require an understanding of the topics and how they are interrelated, not just a familiarity with the key words. An Instructor's Guide is available to any instructor who uses the text. It includes: Chapter-by-chapter comments on subtopics that emphasize the pitfalls to avoid; Suggested coverage times; Detailed solutions to most even-

numbered exercises; Sample quizzes, exams, and final exams. This textbook has been used in classes at Casper College (WY), Grinnell College (IA), Luzerne Community College (PA), University of the Puget Sound (WA)."-

[Mathematics for Computer Science](#) Createspace Independent Publishing Platform

'Discrete Mathematical Structures' provides an introductory mathematical foundation for further advanced study in data structures, algorithms, compilers and theory of computation.

[Mathematical Structures for Computer Science](#) Springer Science & Business Media

Discrete Structures introduces readers to the mathematical structures and methods that form the foundation of computer science and features multiple techniques that readers will turn to regularly throughout their careers in computer and information sciences. Over the course of five modules, students learn specific skills including binary and modular arithmetic, set notation, methods of counting, evaluating sums, and solving recurrences. They study the basics of probability, proof by induction, growth of functions, and analysis techniques. The book also discusses general problem-solving techniques that are widely applicable to real problems. Each module includes motivation applications, technique, theory, and further opportunities for application. Informed by extensive experience teaching in computer science programs, Discrete Structures has been developed specifically for first-year students in those programs. The material is also suitable for courses in computer engineering, as well as those for students who are transferring from other disciplines and just beginning their computer science or engineering education.

Discrete Structures, Logic, and Computability World Scientific

Note: This is a custom edition of Levin's full Discrete Mathematics text, arranged specifically for use in a discrete math course for future elementary and middle school teachers. (It is NOT a new and updated edition of the main text.) This gentle introduction to discrete mathematics is written for first and second year math majors, especially those who intend to teach. The text began as a set of lecture notes for the discrete mathematics course at the University of Northern Colorado. This course serves both as an introduction to topics in discrete math and as the "introduction to proof" course for math majors. The course is usually taught with a large amount of student inquiry, and this text is written to help facilitate this. Four main topics are covered: counting, sequences, logic, and graph theory. Along the way proofs are introduced, including proofs by contradiction, proofs by induction, and combinatorial proofs. While there are many fine discrete math textbooks available, this text has the following advantages: - It is written to be used in an inquiry rich course.- It is written to be used in a course for future math teachers.- It is open source, with low cost print editions and free electronic editions.

DISCRETE MATHEMATICAL STRUCTURES Cengage Learning

This updated text, now in its Third Edition, continues to provide the basic concepts of discrete mathematics and its applications at an appropriate level of rigour. The text teaches mathematical logic, discusses how to work with discrete structures, analyzes combinatorial approach to problem-solving and develops an ability to create and understand mathematical models and algorithms essentials for writing computer programs. Every concept introduced in the text is first explained from the point of view of mathematics, followed by its relation to Computer Science. In addition, it offers excellent coverage of graph theory, mathematical reasoning, foundational material on set theory, relations and their computer representation, supported by a number of worked-out examples and exercises to reinforce the students' skill. Primarily intended for undergraduate students of Computer Science and Engineering, and Information Technology, this text will also be useful for undergraduate and postgraduate students of Computer Applications. New to this Edition Incorporates many new sections and subsections such as recurrence relations with constant coefficients, linear recurrence relations with and without constant coefficients, rules for counting and shorting, Peano axioms, graph connecting, graph scanning algorithm, lexicographic shorting, chains, antichains and order-isomorphism, complemented lattices, isomorphic order sets, cyclic groups, automorphism groups, Abelian groups, group homomorphism, subgroups, permutation groups, cosets, and quotient subgroups. Includes many new worked-out examples, definitions, theorems, exercises, and GATE level MCQs with answers.

Introduction · to Mathematical Structures and · Proofs MIT Press

'The presentation is modeled on the discursive style of the Bourbaki collective, and the coverage of topics is rich and varied. Grandis has provided a large selection of exercises and has sprinkled orienting comments throughout. For an undergraduate library where strong students seek an overview of a significant portion of mathematics, this would be an excellent acquisition. Summing up: Recommended.'

CHOICESince the last century, a large part of Mathematics is concerned with the study of mathematical structures, from groups to fields and vector spaces, from lattices to Boolean algebras, from metric spaces to topological spaces, from topological groups to Banach spaces. More recently, these structured sets and their transformations have been assembled in higher structures, called categories. We want to give a structural overview of these topics, where the basic facts of the different theories are unified through the 'universal properties' that they satisfy, and their particularities stand out, perhaps even more. This book can be used as a textbook for undergraduate studies and for self-study. It can provide students of Mathematics with a unified perspective of subjects which are often kept apart. It is also addressed to students and researchers of disciplines having strong interactions with Mathematics, like Physics and Chemistry, Statistics, Computer Science, Engineering.

Mathematical Structures Of Quantum Mechanics Prentice Hall

Master the fundamentals of discrete mathematics with DISCRETE MATHEMATICS FOR COMPUTER SCIENCE with Student Solutions Manual CD-ROM! An increasing number of computer scientists from diverse areas are using discrete mathematical structures to explain concepts and problems and this mathematics text shows you how to express precise ideas in clear mathematical language. Through a wealth of exercises and examples, you will learn how mastering discrete mathematics will help

you develop important reasoning skills that will continue to be useful throughout your career.

Discrete Mathematical Structures Macmillan Higher Education

Discrete Structure, Logic, and Computability introduces the beginning computer science student to some of the fundamental ideas and techniques used by computer scientists today, focusing on discrete structures, logic, and computability. The emphasis is on the computational aspects, so that the reader can see how the concepts are actually used. Because of logic's fundamental importance to computer science, the topic is examined extensively in three phases that cover informal logic, the technique of inductive proof; and formal logic and its applications to computer science.

Discrete Mathematics for Computer Science Springer Nature

This textbook introduces enumerative combinatorics through the framework of formal languages and bijections. By starting with elementary operations on words and languages, the authors paint an insightful, unified picture for readers entering the field. Numerous concrete examples and illustrative metaphors motivate the theory throughout, while the overall approach illuminates the important connections between discrete mathematics and theoretical computer science. Beginning with the basics of formal languages, the first chapter quickly establishes a common setting for modeling and counting classical combinatorial objects and constructing bijective proofs. From here, topics are modular and offer substantial flexibility when designing a course. Chapters on generating functions and partitions build further fundamental tools for enumeration and include applications such as a combinatorial proof of the Lagrange inversion formula. Connections to linear algebra emerge in chapters studying Cayley trees, determinantal formulas, and the combinatorics that lie behind the classical Cayley-Hamilton theorem. The remaining chapters range across the Inclusion-Exclusion Principle, graph theory and coloring, exponential structures, matching and distinct representatives, with each topic opening many doors to further study. Generous exercise sets complement all chapters, and miscellaneous sections explore additional applications. Lessons in Enumerative Combinatorics captures the authors' distinctive style and flair for introducing newcomers to combinatorics. The conversational yet rigorous presentation suits students in mathematics and computer science at the graduate, or advanced undergraduate level. Knowledge of single-variable calculus and the basics of discrete mathematics is assumed; familiarity with linear algebra will enhance the study of certain chapters.

Discrete Mathematics for Computer Science Code Energy

Discrete Mathematics for Computer Science: An Example-Based Introduction is intended for a first- or second-year discrete mathematics course for computer science majors. It covers many important mathematical topics essential for future computer science majors, such as algorithms, number representations, logic, set theory, Boolean algebra, functions, combinatorics, algorithmic complexity, graphs, and trees. Features Designed to be especially useful for courses at the community-college level Ideal as a first- or second-year textbook for computer science majors, or as a general introduction to discrete mathematics Written to be accessible to those with a limited mathematics background, and to aid with the transition to abstract thinking Filled with over 200 worked examples, boxed for easy reference, and over 200 practice problems with answers Contains approximately 40 simple algorithms to aid students in becoming proficient with algorithm control structures and pseudocode Includes an appendix on basic circuit design which provides a real-world motivational example for computer science majors by drawing on multiple topics covered in the book to design a circuit that adds two eight-digit binary numbers Jon Pierre Fortney graduated from the University of Pennsylvania in 1996 with a BA in Mathematics and Actuarial Science and a BSE in Chemical Engineering. Prior to returning to graduate school, he worked as both an environmental engineer and as an actuarial analyst. He graduated from Arizona State University in 2008 with a PhD in Mathematics, specializing in Geometric Mechanics. Since 2012, he has worked at Zayed University in Dubai. This is his second mathematics textbook.

Connecting Discrete Mathematics and Computer Science Springer

This text has been designed as a complete introduction to discrete mathematics, primarily for computer science majors in either a one or two semester course. The topics addressed are of genuine use in computer science, and are presented in a logically coherent fashion. The material has been organized and interrelated to minimize the mass of definitions and the abstraction of some of the theory. For example, relations and directed graphs are treated as two aspects of the same mathematical idea. Whenever possible each new idea uses previously encountered material, and then developed in such a way that it simplifies the more complex ideas that follow.

Discrete Mathematical Structures for Computer Science S. Chand Publishing

John Vince describes a range of mathematical topics to provide a foundation for an undergraduate course in computer science, starting with a review of number systems and their relevance to digital computers, and finishing with differential and integral calculus. Readers will find that the author's visual approach will greatly improve their understanding as to why certain mathematical structures exist, together with how they are used in real-world applications. Each chapter includes full-colour illustrations to clarify the mathematical descriptions, and in some cases, equations are also coloured to reveal vital algebraic patterns. The numerous worked examples will consolidate comprehension of abstract mathematical concepts. Foundation Mathematics for Computer Science covers number systems, algebra, logic, trigonometry, coordinate systems, determinants, vectors, matrices, geometric matrix transforms, differential and integral calculus, and reveals the names of the mathematicians behind such inventions. During this journey, John Vince touches upon more esoteric topics such as quaternions, octonions, Grassmann algebra, Barycentric coordinates, transfinite sets and prime numbers. Whether you intend to pursue a career in programming, scientific visualisation, systems design, or real-time computing, you should find the author's literary style refreshingly lucid and engaging, and prepare you for more advanced texts.

[Theorem Proving in Higher Order Logics](#) Pearson Education India

[Mathematical Structures for Computer Science](#) Macmillan

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