Essential Mathematics For Science And Technology A Self Learning Guide

For students anxious about statistics, this hands-on workbook is packed with clear explanations, real-world examples and practical exercises to gain the necessary maths skills to tackle statistics with confidence. Grounded in a social science context, it features: · Clear introductions to symbols and tasks · Multiple choice questions and exercises · Real world case studies and datasets · A glossary of terms The book offers plenty of opportunities to practice through the accompanying online resources, which also includes datasets and a selection of author videos.

Political science and sociology increasingly rely on mathematical modeling and sophisticated data analysis, and many graduate programs in these fields now require students to take a "math camp" or a semester-long or yearlong course to acquire the necessary skills. Available textbooks are written for mathematics or economics majors, and fail to convey to students of political science and sociology the reasons for learning often-abstract mathematical concepts. A Mathematics Course for Political and Social Research fills this gap, providing both a primer for math novices in the social sciences and a handy reference for seasoned researchers. The book begins with the fundamental building blocks of mathematics and basic algebra, then goes on to cover essential subjects such as calculus in one and more than one variable, including optimization, constrained optimization, and implicit functions; linear algebra, including Markov chains and eigenvectors; and probability. It describes the intermediate steps most other textbooks leave out, features numerous exercises throughout, and grounds all concepts by illustrating their use and importance in political science and sociology. Uniquely designed and ideal for students and researchers in political science and sociology Uses practical examples from political science and sociology Features "Why Do I Care?" sections that explain why concepts are useful Includes numerous exercises Complete online solutions manual (available only to professors, email david.siegel at duke.edu, subject line "Solution Set") Selected solutions available online to students

This text is an accessible, student-friendly introduction to the wide range of mathematical and statistical tools needed by the forensic scientist in the analysis, interpretation and presentation of experimental measurements. From a basis of high school mathematics, the book develops essential quantitative analysis techniques within the context of a broad range of forensic applications. This clearly structured text focuses on developing core mathematical skills together with an understanding of the calculations associated with the analysis of experimental work, including an emphasis on the use of graphs and the evaluation of uncertainties. Through a broad study of probability and statistics, the reader is led ultimately to the use of Bayesian approaches to the evaluation of evidence within the court. In every section, forensic applications such as ballistics trajectories, post-mortem cooling, aspects of forensic pharmacokinetics, the matching of glass evidence, the formation of bloodstains and the interpretation of DNA profiles are discussed and examples of calculations are worked through. In every chapter there are numerous self-assessment problems to aid student learning. Its broad scope and forensically focused coverage make this book an essential text for students embarking on any degree course in forensic science or forensic analysis, as well as an invaluable reference for post-graduate students and forensic professionals. Key features: Offers a unique mix of mathematics and statistics topics, specifically tailored to a forensic science undergraduate degree. All topics illustrated with examples from the forensic science discipline. Written in an accessible, student-friendly way to engage interest and enhance learning and confidence. Assumes only a basic high-school level prior mathematical knowledge.

The book tries to explain the Finnish teacher education and school system as well as Finnish children's learning environment at the level of the comprehensive school, and thus give explanations for the Finnish PISA success. The book is a joint enterprise of Finnish teacher educators.

Engineering Science will help you understand the scientific principles involved in engineering. Focusing primarily upon core mechanical and electrical science topics, students enrolled on an Engineering Foundation degree and Higher National Engineering qualification will find this book an invaluable aid to their learning. The subject matter covered includes sections on the mechanics of solids, dynamics, thermodynamics, electrostatics and electromagnetic principles, and AC and DC circuit theory. Knowledge-check questions, summary sections and activities are included throughout the book, and the necessary background mathematics is applied and integrated alongside the appropriate areas of engineering being studied. The result is a clear, straightforward and easily accessible textbook that encourages independent study and covers most of the scientific principles that students are likely to meet at this level. It is supported with a companion website at http://www.key2engineeringscience.com for students and lecturers: Solutions to the Test your Knowledge questions in the book Further guidance on essential mathematics Extra chapters on vapour properties, cycles and plants Downloadable SCILAB scripts that helps simplify advanced mathematical content

This Text Provides the essential mathematics needed to study computing. The authors are aware that many student do not have the same mathematical background common 5 years ago and this book has been written to accommodate these changes.Many exercises are provided with detailed answers and difficult concepts are thoroughly illustrated to help learning. Chapters are designed to be read in isolation with interdependence between chapters minimalised.

In a comprehensive yet easy-to-follow manner, Discrete Mathematics for New Technology follows the progression from the basic mathematical concepts covered by the GCSE in the UK and by high-school algebra in the USA to the more sophisticated mathematical concepts examined in the latter stages of the book. The book punctuates the rigorous treatment of theory with frequent uses of pertinent examples and exercises, enabling readers to achieve a feel for the subject at hand. The exercise hints and solutions are provided at the end of the book. Topics covered include logic and the nature of mathematical proof, set theory, relations and functions, matrices and systems of linear equations, algebraic structures, Boolean algebras, and a thorough treatise on graph theory. Although aimed primarily at computer science students, the structured development of the mathematics enables this text to be used by undergraduate mathematicians, scientists, and others who require an understanding of discrete mathematics.

This textbook provides a thorough introduction to the essential mathematical techniques needed in the physical sciences. Carefully structured as a series of self-paced and self-contained chapters, this text covers the basic techniques on which more advanced material is built. Starting with arithmetic and algebra, the text then moves on to cover basic elements of geometry, vector algebra, differentiation and finally integration, all within an applied environment. The reader is guided through these different techniques with the help of numerous worked examples, applications, problems, figures, and summaries. The authors provide high-quality and thoroughly class-tested material to meet the changing needs of science students. The book: * Is a carefully structured text, with

self-contained chapters. * Gradually introduces mathematical techniques within an applied environment. * Includes many worked examples, applications, problems, and summaries in each chapter. This text is an essential resource for all students of physics, chemistry and engineering, needing to develop or refresh their knowledge of basic mathematics. The book's structure makes it equally valuable for course use, home study or distance learning.

Provides an overview of essential mathematics concepts, plus classroom-ready activities aligned with NCTM content standards, calculator exercises, a glossary of mathematical terms, and reproducible blackline masters.

The mathematical methods that physical scientists need for solving substantial problems in their fields of study are set out clearly and simply in this tutorial-style textbook. Students will develop problem-solving skills through hundreds of worked examples, self-test questions and homework problems. Each chapter concludes with a summary of the main procedures and results and all assumed prior knowledge is summarized in one of the appendices. Over 300 worked examples show how to use the techniques and around 100 self-test questions in the footnotes act as checkpoints to build student confidence. Nearly 400 end-of-chapter problems combine ideas from the chapter to reinforce the concepts. Hints and outline answers to the odd-numbered problems are given at the end of each chapter, with fully-worked solutions to these problems given in the accompanying Student Solutions Manual. Fully-worked solutions to all problems, password-protected for instructors, are available at www.cambridge.org/essential.

Modern development of science and technology is based to a large degree on computer modelling. To understand the principles and techniques of computer modelling, students should first get a strong background in classical numerical methods, which are the subject of this book. This text is intended for use in a numerical methods course for engineering and science students, but will also be useful as a handbook on numerical techniques for research students. Essentials of Scientific Computing is as self-contained as possible and considers a variety of methods for each type of problem discussed. It covers the basic ideas of numerical techniques, including iterative process, extrapolation and matrix factorization, and practical implementation of the methods shown is explained through numerous examples. An introduction to MATLAB is included, together with a brief overview of modern software widely used in scientific computations. Outlines classical numerical methods, which is essential for understanding the principles and techniques of computer modelling Intended for use in a numerical methods course for engineering and science students, but will also be useful as a handbook on numerical techniques for research students Covers the basic ideas of numerical techniques, including iterative process, extrapolation and matrix factorization

Essential Mathematics for the Social Sciences is designed for first-year graduate students in quantitative social science programs who may not have taken a math course since high school, and lack confidence in their math abilities. It aims to break students' reliance on using basic models in statistical software, and helps give them confidence to adapt models to their theories, to identify and address errors, and to truly understand how the software produces results. This book teaches the essential mathematical ideas that underlie important quantitative methods in the social sciences, with a particular emphasis on linear regression, advanced probability models, formal theory, and computer simulation. Jonathan Kropko works through applied problems, showing students how to solve them. Students who work their way through this text will acquire the confidence to genuinely engage with the topics in advanced quantitative methodology, instead of defaulting to learning a computer program.

Clear and engaging introduction for graduate students in engineering and the physical sciences to essential topics of applied mathematics.

Knut Sydsaeter/Peter Hammond Essential Mathematics for Economic Analysis """Essential Mathematics for Economic Analysis"provides an invaluable introduction to mathematical analysis for economists and students from other social science backgrounds taking a general course in mathematics. The coverage is comprehensive, ranging from elementary algebra to more advanced material, whilst focusing on all the core topics usually taught in undergraduate courses on mathematics for economists. FEATURES An intelligent approach to teaching mathematics, based on years of experience. The book has mathematical rigour and a strong focus on mathematical reasoning. Large selection of worked examples throughout the book. These are not just specific to economics, as most topics are first dealt with from a purely mathematical point of view before providing economic insight. Large number of problems for students to solve. Answers to odd-numbered questions included in the back of the book. The book is primarily intended for undergraduate courses in Mathematics for Economists at first and second year level. Students are expected to have completed A-Level mathematics, or at least a preliminary course. However, there is considerable coverage of basic material in early revision or 'catch-up' chapters. The book is also appropriate for students of other social sciences who are taking a general mathematics course. Knut Sydsaeterhas been a Professor of Mathematics in the Economics Department at the University of Oslo since 1985, and has extensive experience in teaching mathematics for economists. In addition to his teaching at Oslo University (since 1965), hehas given graduate courses in dynamic optimization at Yale, Berkeley, and Gothenborg. He has written and co-authored a number of books, of which several have been translated into many languages. Peter Hammondhas been a Professor of Economics at Stanford University since 1979, and earlier had the same position at the University of Essex. He completed a BA in Mathematics and a PhD in Economics at Cambridge University. He has been an editor of the "Review of Economic Studies," and of the Econometric Society Monograph Series, and is currently on the editorial boards of "Social Choice and Welfare "and of the "Journal of Public Economic Theory."

"Prescriptive modeling is a technique that enables you to generate completely new innovation scenarios to find those that are most interesting and feasible. It's a method you can use to generate new, innovative business models that are capable of creating change in your organization. In this video, you'll learn the essential mathematics of prescriptive modeling, and gain an understanding of why we need to approach business model innovation as a technical and scientific problem. Using a case study, we'll walk how to systematically identify, prioritize, and eliminate risks to remove these obstacles from the process. You'll also learn some essential techniques of prescriptive modeling, fundamental vocabulary, and how the mathematical concepts we've covered strengthen our ability to create useful simulations."--Resource description page.

Essential Mathematics and Statistics for ScienceWiley

Across the world STEM (learning and work in Science, Technology, Engineering and Mathematics) has taken central importance in education and the economy in a way that few other disciplines have. STEM competence has become seen as key to higher productivity, technological adaptation and research-based innovation. No area of educational provision has a greater current importance than the STEM disciplines yet there is a surprising dearth of comprehensive and world-wide information about STEM policy, participation, programs and practice. The Age of STEM is a state of the art survey of the global trends and major country initiatives in STEM. It gives an international overview of issues such as: STEM strategy and coordination curricula, teaching and assessment women in STEM indigenous students research training STEM in the graduate labour markets STEM breadth and STEM depth The individual chapters give comparative international analysis as well as a global overview, particularly focusing on the growing number of policies and practices in mobilising and developing talent in the STEM fields. The book will be of particular interest to anyone involved in educational policy, those in education management and leaders in both schooling and tertiary education. It will have a wider resonance among practitioners in the STEM disciplines, particularly at university level, and for those interested in contemporary public policy.

Updated and expanded, Discrete Mathematics for New Technology, Second Edition provides a sympathetic and accessible introduction to discrete mathematics, including the core mathematics requirements for undergraduate computer science students. The approach is comprehensive yet maintains an easy-to-follow progression from the basic mathematical ideas to the more sophisticated concepts examined in the latter stages of the book. Although the theory is presented rigorously, it is illustrated by the frequent use of pertinent examples and is

further reinforced with exercises-some with hints and solutions-to enable the reader to achieve a comprehensive understanding of the subject at hand. New to the Second Edition Numerous new examples and exercises designed to illustrate and reinforce mathematical concepts and facilitate students' progression through the topics New sections on typed set theory and an introduction to formal specification Presenting material that is at the foundations of mathematics itself, Discrete Mathematics for New Technology is a readable, friendly textbook designed for non-mathematicians as well as for computing and mathematics undergraduates alike.

Maths for Geoscientists is an accessible, student-friendly introduction to the essential mathematics required by those students taking degree courses within the Geosciences. Clearly structured throughout, this book carefully guides the student step by step through the mathematics they will encounter and will provide numerous applied examples throughout to enhance students understanding and to place each technique into context. Opening with a chapter explaining the need for studying mathematics within geosciences the book then moves on to cover algebra, equations, solutions, logarithms and exponentials, statistics and probability, trigonometry, vectors and calculus. The final chapter helps to bring it all together and provides the students with sample projects to test their knowledge. Worked applied examples are included in each chapter along with applied problem questions which are a mix of straightforward maths questions, word questions (developing maths to words), and more involved questions that involve the manipulation and interpretation of real and synthetic data.

This book covers the main areas of mathematics used in the first years of a typical engineering, science or applied mathematics degree. This is not a textbook. It is a concise guide to what the important skills in mathematics are: the ones that need to be remembered. This second edition also includes the essential elements of MATLAB and Maple – the two most common computer tools used by students at university.

This adaptation of Arfken and Weber's bestselling 'Mathematical Methods for Physicists' is a comprehensive, accessible reference for using mathematics to solve physics problems. Introductions and review material provide context and extra support for key ideas, with detailed examples.

As in previous editions, the focus in ESSENTIAL MATHEMATICS with APPLICATIONS, remains on the Aufmann Interactive Method (AIM). Students are encouraged to be active participants in the classroom and in their own studies as they work through the How To examples and the paired Examples and You Try It problems. The role of active participant is crucial to success. Presenting students with worked examples, and then providing them with the opportunity to immediately work similar problems, helps them build their confidence and eventually master the concepts. To this point, simplicity plays a key factor in the organization of this edition, as in all other editions. All lessons, exercise sets, tests, and supplements are organized around a carefully-constructed hierarchy of objectives. This objective-based approach not only serves the needs of students, in terms of helping them to clearly organize their thoughts around the content, but instructors as well, as they work to design syllabi, lesson plans, and other administrative documents. The Eighth Edition features a new design, enhancing the Aufmann Interactive Method and the organization of the text around objectives, making the pages easier for both students and instructors to follow. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Maths for Science overturns the misconception that maths is a daunting, theory-filled subject by providing a confidence-boosting overview of essential mathematical skills and techniques. Written in a clear, straightforward style, with examples and practice problems throughout, it is the ideal guide for all science students.

Essential Mathematics series for Classes 9 and 10 is based on the latest syllabus prescribed by the Inter-State Board for Anglo-Indian Education and ISCE. The books are written by Mr P A J Lewis, an eminent mathematics author. A large number of solved examples are provided for practice. A list of important definitions, formulae and results are provided in the form of Points to Remember.

A complete introduction to the multidisciplinary applications of mathematical methods In order to work with varying levels of engineering and physics research, it is important to have a firm understanding of key mathematical concepts such as advanced calculus, differential equations, complex analysis, and introductory mathematical physics. Essentials of Mathematical Methods in Science and Engineering provides a comprehensive introduction to these methods under one cover, outlining basic mathematical skills while also encouraging students and practitioners to develop new, interdisciplinary approaches to their research. The book begins with core topics from various branches of mathematics such as limits, integrals, and inverse functions. Subsequent chapters delve into the analytical tools that are commonly used in scientific and engineering studies, including vector analysis, generalized coordinates, determinants and matrices, linear algebra, complex numbers, complex analysis, and Fourier series. The author provides an extensive chapter on probability theory with applications to statistical mechanics and thermodynamics that complements the following chapter on information theory, which contains coverage of Shannon's theory, decision theory, game theory, and quantum information theory. A comprehensive list of references facilitates further exploration of these topics. Throughout the book, numerous examples and exercises reinforce the presented concepts and techniques. In addition, the book is in a modular format, so each chapter covers its subject thoroughly and can be read independently. This structure affords flexibility for individualizing courses and teaching. Providing a solid foundation and overview of the various mathematical methods and applications in multidisciplinary research, Essentials of Mathematical Methods in Science and Engineering is an excellent text for courses in physics, science, mathematics, and engineering at the upper-undergraduate and graduate levels. It also serves as a useful reference for scientists and engineers who would like a practical review of mathematical methods.

A more intuitive approach to the mathematical foundation of computer science Discrete mathematics is the basis of much of computer science, from algorithms and automata theory to combinatorics and graph theory. This textbook covers the discrete mathematics that every computer science student needs to learn. Guiding students quickly through thirty-one short chapters that discuss one major topic each, this flexible book can be tailored to fit the syllabi for a variety of courses. Proven in the classroom, Essential Discrete Mathematics for Computer Science aims to teach mathematical reasoning as well as concepts and skills by stressing the art of proof. It is fully illustrated in color, and each chapter includes a concise summary as well as a set of exercises. The text requires only precalculus, and where calculus is needed, a quick summary of the basic facts is provided. Essential Discrete Mathematics for Computer Science is the ideal introductory textbook for standard undergraduate courses, and is also suitable for high school courses, distance education for adult learners, and self-study. The essential introduction to discrete mathematics Features thirty-one short chapters, each suitable for a single class lesson Includes more than 300 exercises Almost every formula and theorem proved in full Breadth of content makes the book adaptable to a variety of courses Each chapter includes a concise summary Solutions manual available to instructors

"What do you assume your students know? What material do you expect them to have a vague idea about (say the proof of Taylor's Theorem) and what material do you want students to know thoroughly (say the derivative of sin x)? This book is an attempt to define what material students should have completely mastered at each year in an applied mathematics, engineering or science degree. Naturally we would like our students to know more than the bare essentials detailed in this book. However, most students do not get full marks in their previous courses and a few weeks after the exam will only remember a small fraction of a course. They are also doing many other courses not involving mathematics and are not constantly using their mathematical skills. This book can then act as guide to what material should realistically be remembered from previous courses. Naturally both the material and the year in which the students see this material will vary from university to university. This book represents what we feel is appropriate to our students during their degrees."--Provided by publisher.

Everything you need to know in order to manage risk effectively within your organization You cannot afford to ignore the explosion in mathematical finance in your quest to remain competitive. This exciting branch of mathematics has very direct practical implications: when a new model is tested and implemented it can have an immediate impact on the financial environment. With risk management top of the

agenda for many organizations, this book is essential reading for getting to grips with the mathematical story behind the subject of financial risk management. It will take you on a journey—from the early ideas of risk quantification up to today's sophisticated models and approaches to business risk management. To help you investigate the most up-to-date, pioneering developments in modern risk management, the book presents statistical theories and shows you how to put statistical tools into action to investigate areas such as the design of mathematical models for financial volatility or calculating the value at risk for an investment portfolio. Respected academic author Simon Hubbert is the youngest director of a financial engineering program in the U.K. He brings his industry experience to his practical approach to risk analysis Captures the essential mathematical tools needed to explore many common risk management problems Website with model simulations and source code enables you to put models of risk management into practice Plunges into the world of high-risk finance and examines the crucial relationship between the risk and the potential reward of holding a portfolio of risky financial assets This book is your one-stop-shop for effective risk management.

This book contains practical exercises and didactic examples, ranging from arithmetic to calculus, including fundamental themes of the algebra and analytic geometry. It is specialized in the teaching and learning of mathematics, in his book and essential levels arises from the problems detected in the knowledge of mathematics at different educational levels. With the skill and judgment of the teacher, the parent or student, this material can be a useful and valuable tool in the rapprochement and gradual mastery of relevant and be mesmerized field of mathematics. With math, everything; nothing without mathematics, it could be the human world he has created and developed the mathematical knowledge as a tool or a key device in the civilizing technological work motto. Mathematical knowledge is also a tool to challenge and intellectual growth, invaluable in the development of the most important brain cognitive abilities

Beginning with a review of the important areas of mathematics, this book then covers many of the underlying theoretical and practical aspects of NMR and MRI spectroscopy from a maths point of view. Competence in algebra and introductory calculus is needed but all other maths concepts are covered. It will bridge a gap between high level and introductory titles used in NMR or MRI spectroscopy. Uniquely, it takes a very careful and pedagogical approach to the mathematics behind NMR and MRI. It leaves out very few steps, which distinguishes it from other books in the field. The author is an NMR laboratory manager and is sympathetic to the frustrations of trying to understand where some of the fundamental equations come from hence his desire to either explicitly derive all equations for the reader or direct them to derivations. This is an essential text aimed at graduate students who are beginning their careers in NMR or MRI spectroscopy and laboratory managers if they need an understanding of the theoretical foundations of the technique.

A Practical, Interdisciplinary Guide to Advanced Mathematical Methods for Scientists and Engineers Mathematical Methods in Science and Engineering, Second Edition, provides students and scientists with a detailed mathematical reference for advanced analysis and computational methodologies. Making complex tools accessible, this invaluable resource is designed for both the classroom and the practitioners; the modular format allows flexibility of coverage, while the text itself is formatted to provide essential information without detailed study. Highly practical discussion focuses on the "how-to" aspect of each topic presented, yet provides enough theory to reinforce central processes and mechanisms. Recent growing interest in interdisciplinary studies has brought scientists together from physics, chemistry, biology, economy, and finance to expand advanced mathematical methods beyond theoretical physics. This book is written with this multi-disciplinary group in mind, emphasizing practical solutions for diverse applications and the development of a new interdisciplinary science. Revised and expanded for increased utility, this new Second Edition: Includes over 60 new sections and subsections more useful to a multidisciplinary audience Contains new examples, new figures, new problems, and more fluid arguments Presents a detailed discussion on the most frequently encountered special functions in science and engineering Provides a systematic treatment of special functions in terms of the Sturm-Liouville theory Approaches second-order differential equations of physics and engineering from the factorization perspective Includes extensive discussion of coordinate transformations and tensors, complex analysis, fractional calculus, integral transforms, Green's functions, path integrals, and more Extensively reworked to provide increased utility to a broader audience, this book provides a self-contained three-semester course for curriculum, self-study, or reference. As more scientific disciplines begin to lean more heavily on advanced mathematical analysis, this resource will prove to be an invaluable addition to any bookshelf.

This self-contained introduction to the fast-growing field of Mathematical Biology is written for students with a mathematical background. It sets the subject in a historical context and guides the reader towards questions of current research interest. A broad range of topics is covered including: Population dynamics, Infectious diseases, Population genetics and evolution, Dispersal, Molecular and cellular biology, Pattern formation, and Cancer modelling. Particular attention is paid to situations where the simple assumptions of homogenity made in early models break down and the process of mathematical modelling is seen in action.

Partial differential equations form an essential part of the core mathematics syllabus for undergraduate scientists and engineers. The origins and applications of such equations occur in a variety of different fields, ranging from fluid dynamics, electromagnetism, heat conduction and diffusion, to quantum mechanics, wave propagation and general relativity.This volume introduces the important methods used in the solution of partial differential equations. Written primarily for second-year and final-year students taking physics and engineering courses, it will also be of value to mathematicians studying mathematical methods as part of their course. The text, which assumes only that the reader has followed a good basic first-year ancillary mathematics course, is self-contained and is an unabridged republication of the third edition published by Longman in 1985.

Physics is expressed in the language of mathematics; it is deeply ingrained in how physics is taught and how it's practiced. A study of the mathematics used in science is thus asound intellectual investment for training as scientists and engineers. This first volume of two is centered on methods of solving partial differential equations (PDEs) and the special functions introduced. Solving PDEs can't be done, however, outside of the context in which they apply to physical systems. The solutions to PDEs must conform to boundary conditions, a set of additional constraints in space or time to be satisfied at the boundaries of the system, that small part of the universe under study. The first volume is devoted to homogeneous boundary-value problems (BVPs), homogeneous implying a system lacking a forcing function, or source function. The second volume takes up (in addition to other topics) inhomogeneous problems where, in addition to the intrinsic PDE governing a physical field, source functions are an essential part of the system. This text is based on a course offered at the Naval Postgraduate School (NPS) and while produced for NPS needs, it will serve other universities well. It is based on the assumption that it follows a math review course, and was designed to coincide with the second quarter of student study, which is dominated by BVPs but also requires an understanding of special functions and Fourier analysis.

This is the first comprehensive monograph on the mathematical theory of the solitaire game "The Tower of Hanoi" which was invented in the 19th century by the French number theorist Édouard Lucas. The book comprises a survey of the historical development from the game's predecessors up to recent research in mathematics and applications in computer science and psychology. Apart from long-standing myths it contains a thorough, largely self-contained presentation of the essential mathematical facts with complete proofs, including also unpublished material. The main objects of research today are the so-called Hanoi graphs and the related Sierpi?ski graphs. Acknowledging the great popularity of the topic in computer science, algorithms and their correctness proofs form an essential part of the book. In view of the most important practical applications of the Tower of Hanoi and its variants, namely in physics, network theory, and cognitive (neuro)psychology, other related structures and puzzles like, e.g., the "Tower of London", are addressed. Numerous captivating integer sequences arise along the way, but also many open questions impose themselves. Central among these is the famed Frame-Stewart conjecture. Despite many

attempts to decide it and large-scale numerical experiments supporting its truth, it remains unsettled after more than 70 years and thus demonstrates the timeliness of the topic. Enriched with elaborate illustrations, connections to other puzzles and challenges for the reader in the form of (solved) exercises as well as problems for further exploration, this book is enjoyable reading for students, educators, game enthusiasts and researchers alike.

This book is a completely revised and updated version of this invaluable text which allows science students to extend necessary skills and techniques, with the topics being developed through examples in science which are easily understood by students from a range of disciplines. The introductory approach eases students into the subject, progressing to cover topics relevant to first and second year study and support data analysis for final year projects. The revision of the material in the book has been matched, on the accompanying website, with the extensive use of video, providing worked answers to over 200 questions in the book plus additional tutorial support. The second edition has also improved the learning approach for key topic areas to make it even more accessible and user-friendly, making it a perfect resource for students of all abilities. The expanding website provides a wide range of support material, providing a study environment within which students can develop their independent learning skills, in addition to providing resources that can be used by tutors for integration into other science-based programmes. Hallmark Features: Applied approach providing mathematics and statistics from the first to final years of undergraduate science courses. Second edition substantially revised to improve the learning approach to key topics and the organisation of resources for ease of use in teaching. Companion website at www.wiley.com/go/currellmaths2 providing: Over 200 videos showing step-by-step workings of problems in the book. Additional materials including related topic areas, applications, and tutorials on Excel and Minitab. Interactive multiple-choice questions for self-testing, with step-by-step video feedback for any wrong answers. A developing resource of study plans for useful topics and applications. Figures from the book for downloading.

This 2006 book addresses the comprehensive introduction to the mathematical principles needed by modern social scientists.

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