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**Editor**

Manish Choudhary

Gauravjeet Singh Reen

**Email**

mchoudhary@cambridge.org

gsreen@cambridge.org

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**Price, Discount and Publication Dates**

Price, discount and publication dates are correct at the time of sending titles to press but are subject to change without notice.
Software Testing is conducted to provide stakeholders with information about the quality of a product under test. The book aims to present testing concepts and methods that can be implemented in practice. It has been developed as a result of the author's 20 years of teaching experience. The text will help to learn how to find software faults before it is made available to its users. A judicious mix of software testing concepts, solved examples and real-life case studies makes it ideal for a basic course on software testing. The book will be a useful resource for students, academicians, software practitioners and researchers.

Contents: 1. Introduction; 2. Functional testing; 3. Essentials of graph theory; 4. Structural testing; 5. Software verification; 6. Creating test cases from requirements and use cases; 7. Selection, minimization and prioritization of test cases for regression testing; 8. Software testing activities; 9. Object oriented testing; 10. Metrics and models in software testing; 11. Testing web applications; 12. Automated test data generation; References; Appendix I: SRS of university registration system; Appendix II: Test cases from use cases; Appendix III: Validity checks; Answers to multiple choice questions.

A Textbook on Automata Theory
P. K. Srimani & Nasir S. F. B.

This book has been designed for students of computer science. Adopting a comprehensive approach to the subject, it presents various concepts with adequate explanations. The logical and structured treatment of the subject promotes better understanding and assimilation. Lucid and well-structured presentation makes the book user-friendly.

It covers the curricula for MCA, BE (Computer Science) and MSc (Computer Science) at various universities and gives students a strong foundation for advanced studies in the field.


Basic Computation and Programming with C
Subrata Saha and Subhodip Mukherjee

This textbook offers detailed coverage on fundamentals of computation and programming in C language. The aim of the book is the make the subject easier and more interesting for the reader. For better understanding of the concepts, the book is divided in three parts including Fundamentals of Computer, Programming with ‘C’ and Model Question Papers with answers. The book offers a unique feature ‘Learn by Question/Answer’ wherein the questions are designed with confidence-based learning methodology. This helps the reader in better understanding of theoretical concepts and its applications. This book will be useful for beginners and undergraduate students of engineering and computer science.

Computer Programs: 315 and Learn by question/answer: 470


Quantum Computation and Quantum Information
10th Anniversary Edition
Michael A. Nielsen & Isaac L. Chuang

One of the most cited books in physics of all time, Quantum Computation and Quantum Information remains the best textbook in this exciting field of science. This 10th Anniversary Edition includes a new Introduction and Afterword from the authors setting the work in context.

This comprehensive textbook describes such remarkable effects as fast quantum algorithms, quantum teleportation, quantum cryptography, and quantum error-correction. Quantum mechanics and computer science are introduced, before moving on to describe what a quantum computer is, how it can be used to solve problems faster than “classical” computers, and its real-world implementation. It concludes with an in-depth treatment of quantum information.

Containing a wealth of figures and exercises, this well-known textbook is ideal for courses on the subject, and will interest beginning graduate students and researchers in physics, computer science, mathematics, and electrical engineering.

Contents: Part I: Fundamental concepts; 1. Introduction and overview; 2. Introduction to quantum mechanics; 3. Introduction to computer science; Part II: Quantum computation; 4. Quantum circuits; 5. The quantum Fourier
The Internet and World Wide Web have revolutionized access to information. Users now store information across multiple platforms from personal computers, to smartphones, to Web sites such as YouTube and Picasa. As a consequence, data management concepts, methods, and techniques are increasingly focused on distribution concerns. That information largely resides in the network, as do the tools that process this information.

This book explains the foundations of XML, the Web standard for data management, with a focus on data distribution. It covers the many facets of distributed data management on the Web, such as description logics, that are already emerging in today's data integration applications and herald tomorrow's semantic Web. It also introduces the machinery used to manipulate the unprecedented amount of data collected on the Web. Several "Putting into Practice" chapters describe detailed practical applications of the technologies and techniques.

Striking a balance between the conceptual and the practical, the book will serve as an introduction to the new global information systems for Web professionals as well as for master's level courses.


ISBN: 9781107629615 450pp PB 695.00
136 b/w illus. 78 tables
### Ad Hoc and Sensor Networks
**Theory and Applications, Second Edition**
Carlos de Morais Cordeiro & Dharmarajan Prakash Agrawal (World Scientific)

This book provides a comprehensive yet easy coverage of ad hoc and sensor networks and fills the gap of existing literature in this growing field. It emphasizes that there is a major interdependence among various layers of the networks protocol stack. Contrary to wired or even one-hop cellular networks, the lack of a fixed infrastructure, the inherent mobility, the wireless channel, and the underlying routing mechanism by ad hoc and sensor networks introduce a number of technological challenges that are difficult to address within the boundaries of a single protocol layer.

**Contents:** Introduction; Routing in Ad Hoc Networks; Broadcasting, Multicasting and Geocasting; Wireless LANs; Wireless PANs; Wireless Mesh Networks; Directional Antenna Systems; Cognitive Radio and Networks; TCP over Ad Hoc Networks; Applications of Sensor Networks; Sensor Networks Design Considerations; Sensor Networks in Controlled Environment and Actuators; Security in Ad Hoc and Sensor Networks; Integrating MANETs, WLANs, and Cellular Networks.

ISBN: 9789382264804 662pp PB ₹ 595.00
33 b/w ilus. 133 exercises

### Microprocessor Architecture
**From Simple Pipelines to Chip Multiprocessors**
Jean-Loup Baer (Cambridge University Press)

This book gives a comprehensive description of the architecture of microprocessors from simple in-order short pipeline designs to out-of-order superscalars. It discusses topics such as:
- The policies and mechanisms needed for out-of-order processing such as register renaming, reservation stations, and reorder buffers
- Optimizations for high performance such as branch predictors, instruction scheduling, and load-store speculations
- Design choices and enhancements to tolerate latency in the cache hierarchy of single and multiple processors
- State-of-the-art multithreading and multiprocessing emphasizing single chip implementations

Topics are presented as conceptual ideas, with metrics to assess the performance impact, if appropriate, and examples of realization. The emphasis is on how things work at a black box and algorithmic level. The author also provides sufficient detail at the register transfer level so that readers can appreciate how design features enhance performance as well as complexity.


ISBN: 9780521187350 382pp PB ₹ 745.00
104 b/w illus. 20 tables 117 exercises

### Computational Discrete Mathematics
**Combinatorics and Graph Theory with Mathematica**
Sriram Pemmaraju & Steven Skiena (Cambridge University Press)

Combinatorica, an extension to the popular computer algebra system Mathematica®, is the most comprehensive software available for teaching and research applications of discrete mathematics, particularly combinatorics and graph theory. This book is the definitive reference/user’s guide to Combinatorica, with examples of all 450 Combinatorica functions in action, along with the associated mathematical and algorithmic theory. The authors cover classical and advanced topics on the most important combinatorial objects: permutations, subsets, partitions, and Young tableaux, as well as all important areas of graph theory: graph construction operations, invariants, embeddings, and algorithmic graph theory.

In addition to being a research tool, Combinatorica makes discrete mathematics accessible in new and exciting ways, by encouraging computational experimentation and visualization. The book is suitable for self-study and as a primary or supplementary textbook for discrete mathematics courses.


ISBN: 9780521733113 494pp PB ₹ 595.00

### Distributed Computing
**Principles, Algorithms, and Systems**
Ajay D. Kshemkalyani & Mukesh Singhal (Cambridge University Press)

Designing distributed computing systems is a complex process requiring a solid understanding of the design problems and the theoretical and practical aspects of their solutions. This comprehensive textbook covers the fundamental principles and models underlying the theory, algorithms and systems aspects of distributed computing. Broad and detailed coverage of the theory is balanced with practical systems-related issues such as mutual exclusion, deadlock detection, authentication, and failure recovery. Algorithms are carefully selected, lucidly presented, and described without complex proofs. Simple explanations and illustrations are used to elucidate the algorithms. Important emerging topics such as peer-to-peer networks and network security are also considered. With vital algorithms, numerous illustrations, examples and homework problems, this textbook is suitable for advanced undergraduate and graduate students of electrical and computer engineering and computer science. Practitioners in data networking and sensor networks will also find this a valuable resource. Additional resources are available online at: www.cambridge.org 9780521876346.

A Student's Guide to Coding and Information Theory
Stefan M. Moser & Po-Ning Chen

This easy-to-read guide provides a concise introduction to the engineering background of modern communication systems, from mobile phones to data compression and storage. Background mathematics and specific engineering techniques are kept to a minimum so that only a basic knowledge of high-school mathematics is needed to understand the material covered. The authors begin with many practical applications in coding, including the repetition code, the Hamming code and the Huffman code. They then explain the corresponding information theory, from entropy and mutual information to channel capacity and the information transmission theorem. Finally, they provide insights into the connections between coding theory and other fields. Many worked examples are given throughout the book, using practical applications to illustrate theoretical definitions. Exercises are also included, enabling readers to double-check what they have learned and gain glimpses into more advanced topics, making this perfect for anyone who needs a quick introduction to the subject.


ISBN: 9781107684577 205pp PB ₹ 345.00
48 b/w illus. 29 tables 38 exercises

Mobile Computing Principles
Designing and Developing Mobile Applications with UML and XML
Reza B'Far

Written to address technical concerns that mobile developers face regardless of the platform (J2ME, WAP, Windows CE, etc.), this book explores the differences between mobile and stationary applications and the architectural and software development concepts needed to build a mobile application. Using UML as a tool, Reza B'far guides the developer through the development process, showing how to document the design and implementation of the application. He focuses on general concepts, while using platforms as examples or as possible tools. After introducing UML, XML, and derivative tools necessary for developing mobile software applications, B'far shows how to build user interfaces for mobile applications. He covers location sensitivity, wireless connectivity, mobile agents, data synchronization, security, and push-based technologies, and finally homes in on the practical issues of mobile application development including the development cycle for mobile applications, testing mobile applications, architectural concerns, and a case study.

Contents: Part I. Introductions to the Main Topics: 1. Introduction to mobile computing; 2. Introduction to mobile development frameworks and tools; 3. XML: document and meta-data format for mobile; 4. Introduction to UML; Part II. Device Independent and Multi-Channel User Interface Development Using UML: 5. Generic

ISBN: 9781107617100 240pp PB ₹ 395.00
47 b/w illus. 12 tables 49 exercises

A Student's Guide to Data and Error Analysis
Herman J. C. Berendsen

All students taking laboratory courses within the physical sciences and engineering will benefit from this book, whilst researchers will find it an invaluable reference. This concise, practical guide brings the reader up-to-speed on the proper handling and presentation of scientific data and its inaccuracies. It covers all the vital topics with practical guidelines, computer programs (in Python), and recipes for handling experimental errors and reporting experimental data. In addition to the essentials, it also provides further background material for advanced readers who want to understand how the methods work. Plenty of examples, exercises and solutions are provided to aid and test understanding, whilst useful data, tables and formulas are compiled in a handy section for easy reference.


ISBN: 9781107648906 756pp PB ₹ 795.00

ISBN: 9780521696234  878pp PB  ₹ 795.00
150 b/w illus.

**Introduction to Software Testing**

**Paul Ammann & Jeff Offutt**

Extensively class-tested, this textbook takes an innovative approach to software testing; it defines testing as the process of applying a few well-defined, general-purpose test criteria to a structure or model of the software. It incorporates the latest innovations in testing, including techniques to test modern types of software such as OO, web applications, and embedded software. The book contains numerous examples throughout. An instructor’s solution manual, PowerPoint slides, sample syllabi, additional examples and updates, testing tools for students, and example software programs in Java are available on an extensive website.


ISBN: 9780521175821  344pp PB  ₹ 595.00
51 tables 101 exercises

**Digital Systems Engineering**

**William J. Daily & John W. Poulton**

What makes some computers slow? Why do some digital systems operate reliably for years while others fail mysteriously every few hours? How can some systems dissipate kilowatts while others operate off batteries? These questions of speed, reliability, and power are all determined by the system-level electrical design of a digital system.

**Digital Systems Engineering** presents a comprehensive treatment of these topics. It combines a rigorous development of the fundamental principles in each area with real world examples of circuits and methods. The book not only serves as an undergraduate textbook, filling the gap between circuit design and logic design, but can also help practicing digital designers keep pace with the speed and power of modern integrated circuits.


ISBN: 9780521670449  688pp PB  ₹ 795.00
617 b/w illus. 59 tables

**Logic in Computer Science**

**Modeling and Reasoning about Systems**

**Michael Huth & Mark Ryan**

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 SATsolvers, 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.

**Contents:** Foreword; 1. Propositional logic; 2. Predicate logic; 3. Verification by model checking; 4. Program verification; 5. Modal logics and agents; 6. Binary decision diagrams; Bibliography; Index.

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10 tables 400 exercises

**C By Example**

**Noel Kalicharan**

C is one of the most popular programming languages. It is flexible, efficient, and highly portable; and can be used to write many different types of programs - from compilers and assemblers to spreadsheets and games. This book is based on ANSI C, the recently adopted standard for the C language.


ISBN: 9780521567008  380pp PB  ₹ 395.00
This textbook describes all phases of modern compiler: lexical analysis, parsing, abstract syntax, semantic actions, intermediate representations, instruction selection via tree matching, dataflow analysis, graph-coloring register allocation, and runtime systems. It includes good coverage of current techniques in code generation and register allocation, as well as functional and object-oriented languages, that is missing from most books. The most accepted and successful techniques are described in a concise way, rather than as a exhaustive catalogue of every possible variant. Detailed descriptions of the interfaces between modules of a compiler are illustrated with actual C header files.


ISBN: 9788175960718 544pp PB ₹ 545.00

Numerical Recipes in C
The Art of Scientific Computing
William H. Press, Saul A. Teukolsky, William T. Vetterling & Brian Flannery

This is the revised and expanded second edition of the hugely popular Numerical Recipes: The Art of Scientific Computing. The product of a unique collaboration among four leading scientists in academic research and industry, Numerical Recipes is a complete text and reference book on scientific computing.


ISBN: 9788185618166 1020pp PB ₹ 595.00

Introduction to Distributed Algorithms
Second Edition
Gerard Tel

The second edition of this successful textbook provides an up-to-date introduction both to the topic, and to the theory behind the algorithms. The author concentrates on algorithms for the point-to-point message passing model, and includes algorithms for the implementation of computer communication networks. Other key areas discussed are algorithms for the control of distributed applications (wave, broadcast, election, termination detection, randomized algorithms for anonymous networks, snapshots, deadlock detection, synchronous systems), and fault tolerance achievable by distributed algorithms. The new two chapters on sense of direction and failure detectors are state-of-the-art and will provide an entry to research in these still developing topics.


ISBN: 9780521605670 608pp PB ₹ 595.00
Randomized Algorithms
Rajeev Motwani & Prabhakar Raghavan

For many applications a randomized algorithm is the simplest algorithm available, or the fastest, or both. This text by two well-known experts in the field presents the basic concepts in the design and analysis of randomized algorithms at a level accessible to beginning graduate students. The first part of the book presents basic tools from probability theory and probabilistic analysis that are recurrent in algorithmic applications. Algorithmic examples are given to illustrate the use of each tool in a concrete setting. In the second part of the book each of the seven chapters focuses on one important area of application of randomized algorithms: data structures, geometric algorithms, graph algorithms, giving a comprehensive and representative selection of the algorithms in these areas.


ISBN: 9780521613903 492pp PB  595.00

Understanding Machine Learning
From Theory to Algorithms
Shai Shalev-Shwartz & Shai Ben-David

Machine learning is one of the fastest growing areas of computer science, with far-reaching applications. The aim of this textbook is to introduce machine learning, and the algorithmic paradigms it offers, in a principled way. The book provides a theoretical account of the fundamentals underlying machine learning and the mathematical derivations that transform these principles into practical algorithms. Following a presentation of the basics, the book covers a wide array of central topics unaddressed by previous textbooks. These include a discussion of the computational complexity of learning and the concepts of convexity and stability; important algorithmic paradigms including stochastic gradient descent, neural networks, and structured output learning; and emerging theoretical concepts such as the PAC-Bayes approach and compression-based bounds. Designed for advanced undergraduates or beginning graduates, the text makes the fundamentals and algorithms of machine learning accessible to students and non-expert readers in statistics, computer science, mathematics and engineering.


ISBN: 9781107512825 409pp PB  995.00

Switching and Finite Automata Theory
Third Edition
Zvi Kohavi & Niraj K. Jha

Understand the structure, behavior, and limitations of logic machines with this thoroughly updated third edition. New topics include:
• CMOS gates
• Logic synthesis
• Logic design for emerging nanotechnologies
• Digital system testing
• Asynchronous circuit design

The intuitive examples and minimal formalism of the previous edition are retained, giving students a text that is logical and easy to follow, yet rigorous. Kohavi and Jha begin with the basics, and then cover combinational logic design and testing, before moving on to more advanced topics in finite-state machine design and testing. Theory is made easier to understand with 200 illustrative examples, and students can test their understanding with over 350 end-of-chapter review questions.


ISBN: 9780521176804 630pp PB  595.00
This textbook, for second- or third-year students of computer science, presents insights, notations, and analogies to help them describe and think about algorithms like an expert, without grinding through lots of formal proof. Solutions to many problems are provided to let students check their progress, while class-tested PowerPoint slides are on the web for anyone running the course. By looking at both the big picture and easy step-by-step methods for developing algorithms, the author guides students around the common pitfalls. He stresses paradigms such as loop invariants and recursion to unify a huge range of algorithms into a few meta-algorithms. The book fosters a deeper understanding of how and why each algorithm works. These insights are presented in a careful and clear way, helping students to think abstractly and preparing them for creating their own innovative ways to solve problems.


ISBN: 9781107592919 230pp PB ₹ 595.00

Python for Scientists
John M. Stewart

Python is a free, open source, easy-to-use software tool that offers a significant alternative to proprietary packages such as MATLAB and Mathematica. This book covers everything the working scientist needs to know to start using Python effectively. The author explains scientific Python from scratch, showing how easy it is to implement and test non-trivial mathematical algorithms and guiding the reader through the many freely available add-on modules. A range of examples, relevant to many different fields, illustrate the program’s capabilities. In particular, readers are shown how to use pre-existing legacy code (usually in Fortran77) within the Python environment, thus avoiding the need to master the original code. Instead of exercises the book contains useful snippets of tested code which the reader can adapt to handle problems in their own field, allowing students and researchers with little computer expertise to get up and running as soon as possible.


ISBN: 9781107512818 332pp PB ₹ 895.00

Social Media Mining
An Introduction
Reza Zafarani, Mohammad Ali Abbasi & Huan Liu

The growth of social media over the last decade has revolutionized the way individuals interact and industries conduct business. Individuals produce data at an unprecedented rate by interacting, sharing, and consuming content through social media. Understanding and processing this new type of data to glean actionable patterns presents challenges and opportunities for interdisciplinary research, novel algorithms and tool development. Social Media Mining integrates social media, social network analysis, and data mining to provide a coherent platform to understand the basics and potentials of social media mining. It introduces the unique problems arising from social media data and presents fundamental concepts, emerging issues, and effective algorithms for network analysis and data mining. Suitable for use in advanced undergraduate and beginning graduate courses as well as professional short courses, the text contains exercises of different degrees of difficulty that improve understanding and help apply concepts, principles and methods for social media mining.


ISBN: 9781107512818 332pp PB ₹ 895.00

109 b/w illus. 20 tables 107 exercises
This book presents methods necessary for high accuracy computing of fluid flow and wave phenomena. These two topics have common threads and are presented in the book in single source format using unified spectral theory of computing.

This book attempts systematically to develop scientific computing from classical approaches - describing equations of motion; classifying, discretizing and solving parabolic, elliptic, hyperbolic PDEs; curvilinear co-ordinates and structured meshing techniques; classical FVM and FEM and solving Navier-Stokes equation by FDM - to its present state of art in high accuracy computing. New topics discussed in this book are:
- Correct error propagation analysis
- Practical compact schemes and global analysis tool
- Aliasing error and its alleviation
- Spurious upstream propagating q-waves
- Explanation of Gibbs phenomenon
- New 1D and 2D filters for LES/DNS without SGS modelling
- Anisotropic skewed wave propagation
- Development and analysis of dispersion relation preservation (DRP) schemes and

The book will be of use to students in Aerospace, Chemical, Civil, Mechanical Engineering, Mathematics and Physics taking advanced courses in computational fluid dynamics and high accuracy computing for wave phenomenon. It will also be relevant to students and researchers in the area of geophysical fluid dynamics.

Contents: Foreword; Preface; Chapter 1: Introduction to Scientific Computing; Chapter 2: Governing Equations of Fluid Mechanics; Chapter 3: Classification of Quasi-linear Partial Differential Equations; Chapter 4: Waves and Space-time Dependence in Computing; Chapter 5: Spatial and Temporal Discretizations of Partial Differential Equations; Chapter 6: Solution Methods for Parabolic Partial Differential Equations; Chapter 7: Solution Methods for Elliptic Partial Differential Equations; Chapter 8: Solution of Hyperbolic PDEs: Signal and Error Propagation; Chapter 9: Curvilinear Coordinates and Grid Generation; Chapter 10: Spectral Analysis of Numerical Schemes and Aliasing Error; Chapter 11: Higher Accuracy and Higher Order Methods; Chapter 12: Introduction to Finite Volume and Finite Element Methods; Chapter 13: Solution of Navier-Stokes Equation; Chapter 14: Recent Developments in Discrete Computing; Exercises; References; Index

Soft Computing in Electromagnetics
Methods and Applications
Balamati Choudhury & Rakesh Mohan Jha

Soft computing methods play an important role in design and optimization, in diverse engineering disciplines including those in electromagnetic (EM) applications. Soft computing techniques are characterized by their ability to provide quick, robust and economically viable solution(s) despite imprecision, uncertainties, and approximations in the formulation. The demand for better wireless communication systems has resulted in a need for high performance, real time EM designs. Accurate, reliable and fast optimization techniques are a priori requirement to meet these design objectives. Soft computing methods such as genetic algorithm (GA), artificial neural network (ANN) and fuzzy logic have been widely used by researchers for microwave design since the last decade.

This book aims to provide the reader with an understanding of these established techniques along with other emerging soft computing techniques and their implementation, in order to solve design and performance issues in various fields of electromagnetics.


ISBN: 9781107122482 244pp HB ₹ 895.00

Machine Learning
The Art and Science of Algorithms that Make Sense of Data
Peter Flach

As one of the most comprehensive machine learning texts around, this book does justice to the field’s incredible richness, but without losing sight of the unifying principles. Peter Flach’s clear, example-based approach begins by discussing how a spam filter works, which gives an immediate introduction to machine learning in action, with a minimum of technical fuss. Flach provides case studies of increasing complexity and variety with well-chosen examples and illustrations throughout. He covers a wide range of logical, geometric and statistical models and state-of-the-art topics such as matrix factorisation and ROC analysis. Particular attention is paid to the central role played by features. The use of established terminology is balanced with the introduction of new and useful concepts, and summaries of relevant background material are provided with pointers for revision if necessary. These features ensure Machine Learning will set a new standard as an introductory textbook.

Prologue and Chapter 1 are freely available online

Pedagogic features include boxes summarising relevant background material and a list of ‘important points to remember’
Epilogue includes open problems in machine learning


ISBN: 9781316506110 414pp PB ₹ 1595.00

Integration - Ready Architecture and Design
Software Engineering with XML Java .NET Wireless Speech and Knowledge Technologies
Jeff Zhuk

What would you do if your IT job was no longer performed in your country? Your survival does not lie in limiting global collaborative engineering. IT workers will survive and prosper because of their ability to innovate to quickly learn and change directions and to evolve from Information Technology into Distributed Knowledge Marketplace. You have no choice but to be proactive learn to stay current even run ahead of the game. Integration-Ready Architecture and Design bridges the gap for a new generation of wired and wireless software technologies and teaches a set of skills that are demanded by fast moving software evolution. This up-to-date textbook integrates theory and practice going from foundations and concepts to specific applications. Through deep insights into almost all areas of modern CIS and IT Zhuk provides an entry into the new world of integrated knowledge and software engineering. Readers will learn the what, why and how of: J2EE, J2ME, .NET, JSAPI, JMS, JMF, SALT, VoiceXML, WAP, 802.11, CDNA, GPRS, CycL, XML, and multiple XML-based technologies including RDF, DAML, SOAP, UDDI, and WDSL. Students, architects, designers, coders and even management benefit from innovative ideas and detailed examples for building multidimensional worlds of enterprise applications and creating distributed knowledge marketplace.


ISBN: 9780521704113 PB ₹ 695.00

Advanced Data Structures
Peter Brass

This text closely examines ideas analysis and implementation details of data structures as a specialised topic in applied algorithms. It looks at efficient ways to realise query and update operations on sets of numbers intervals or strings by various data structures including: search trees; structures for sets of intervals or piece-wise constant functions; orthogonal range search structures; heaps; union-find structures; dynamization and persistence of structures; structures for strings; and hash tables. Instead of relegating data structures to trivial material used to illustrate object-oriented programming methodology this is the first volume to show data structures as a crucial algorithmic topic.


ISBN: 9781107439825 474pp PB ₹ 695.00

Emerging Wireless Technologies and the Future Mobile Internet
Dipankar Raychaudhuri, Mario Gerla

This book provides a preview of emerging wireless technologies and their architectural impact on the future mobile Internet. The reader will find an overview of architectural considerations for the mobile Internet along with more detailed technical discussion of new protocol concepts currently being considered at the research stage. The first chapter starts with a discussion of anticipated mobile/wireless usage scenarios leading to an identification of new protocol features for the future Internet. This is followed by several chapters that provide in-depth coverage of next-generation wireless standards ad hoc and mesh network protocols opportunistic delivery and delay tolerant networks sensor network architectures and protocols cognitive radio networks vehicular networks security and privacy and experimental systems for future Internet research. Each of these contributed chapters includes a discussion of new networking requirements for the wireless scenario under consideration architectural concepts and specific protocol designs many still at research stage.


ISBN: 9781107439825 474pp PB ₹ 695.00
Computational Principles of Mobile Robotics
Gregory Dudek & Michael Jenkin

This textbook for advanced undergraduates and graduate students emphasizes algorithms for a range of strategies for locomotion sensing and reasoning. It concentrates on wheeled and legged mobile robots but discusses a variety of other propulsion systems. This edition includes advances in robotics and intelligent machines over the ten years prior to publication including significant coverage of SLAM (simultaneous localization and mapping) and multi-robot systems. It includes additional mathematical background and an extensive list of sample problems. Various mathematical techniques that were assumed in the first edition are now briefly introduced in appendices at the end of the text to make the book more self-contained. Researchers as well as students in the field of mobile robotics will appreciate this comprehensive treatment of state-of-the-art methods and key technologies.

Contents:
1. Overview and motivation;
2. Fundamental problems; Part I. Locomotion and Perception: 3. Mobile robot hardware;

ISBN: 9781107678644 330pp PB ₹ 575.00
100 b/w illus. 5 tables

Enterprise Java Computing
Applications and Architectures
Govind Seshadri, Gopalan Suresh Raj & Terence Par

Written by a seasoned Java expert, Enterprise Java Computing is the ideal hands-on reference not only for mastering cutting-edge concepts but also for gaining valuable insights into practical design and deployment issues. Using this book developers learn to: integrate relational databases with RMI and servlets using JDBC; develop sophisticated servlet-based middleware; design multi-tier EJB applications; write JNI services; understand advanced issues regarding RMI and Java IDL development; and perform Java/legacy-system integration using JNI. This book empowers corporate developers to deliver mission-critical real-world Java applications. With ‘Enterprise Java Computing’ readers master the critical building blocks necessary for developing robust client-server applications without getting bogged down in the specifics of the Java language and its syntax.

ISBN: 9781107447400 406pp PB ₹ 695.00
243 b/w illus. 6 tables 96 exercises

Handshake Circuits
An Asynchronous Architecture for VLSI Programming
Kees van Berkel; Foreword by Martin Rem

Design by programming has proved very successful in the development of complex software systems. This book describes the construction of programs for VLSI digital circuit design using the language Tangram and shows how they can be compiled automatically in fully asynchronous circuits. Handshake circuits were invented by the author to separate questions involving the efficient implementation of the VLSI circuits from issues arising in their design. Dr van Berkel presents a mathematical theory of handshake circuits and a silicon compiler supported by a correctness proof. The treatment of VLSI realizations of handshake circuits includes various forms of optimization handshake refinement message encoding circuit initialization and testing. The approach is illustrated with a host of examples drawn from a wide range of application areas. The book will be of use to electrical engineers and computer scientists involved in VLSI design.

Contents:

ISBN: 9781107447349 240pp PB ₹ 595.00
57 b/w illus. 10 tables

Social Media Intelligence
Wendy W. Moe & David A. Schweidel

In the world of Facebook Twitter and Yelp water-cooler conversations with co-workers and backyard small talk with neighbors have moved from the physical world to the digital arena. In this new landscape organizations ranging from Fortune 500 companies to government agencies to political campaigns continuously monitor online opinions in an effort to guide their actions. Are consumers satisfied with our product? How are our policies perceived? Do voters agree with our platform? Measuring online opinion is more complex than just reading a few posted reviews. Social media is replete with noise and chatter that can contaminate monitoring efforts. By knowing what shapes online opinions organizations can better uncover the valuable insights hidden in the social media chatter and better inform strategy. This book can help anyone facing the challenge of making sense of social media data to move beyond the current practice of social media monitoring to more comprehensive use of social media intelligence.

ISBN: 9781107690073 372pp PB ₹ 595.00
57 b/w illus. 22 tables
Contents: Part I. Foundations: 1. The beginnings of social media intelligence; 2. From politics to new products to sports everyone has an opinion; Part II. Online Opinion or Online Noise: 3. Why do we share our opinions?; 4. The social effects of strangers; Part III. Conversational Trends: 5. Opinion ecosystems and the evolution within; 6. Is social media fragmenting the population?; Part IV. Social Media Intelligence: 7. Managing social media communities for better social media intelligence; 8. Cutting through the online chatter; 9. Intelligence integration; 10. Building social media intelligence into our strategies; 11. Moving from social media monitoring to social media intelligence.

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215 b/w illus. 11 tables 300 exercises

This book covers all you need to know to model and design software applications from use cases to software architectures in UML and shows how to apply the COMET UML-based modeling and design method to real-world problems. The author describes architectural patterns for various architectures such as broker discovery and transaction patterns for service-oriented architectures and addresses software quality attributes including maintainability modifiability testability traceability scalability reusability performance availability and security. Complete case studies illustrate design issues for different software architectures: a banking system for client/server architecture an online shopping system for service-oriented architecture an emergency monitoring system for component-based software architecture and an automated guided vehicle for real-time software architecture. Organized as an introduction followed by several short self-contained chapters the book is perfect for senior undergraduate or graduate courses in software engineering and design and for experienced software engineers wanting a quick reference at each stage of the analysis design and development of large-scale software systems.


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ISBN: 9781107447356 578pp PB ₹ 895.00
344 b/w illus.
A Textbook on Automata Theory
PK. Srimani & S.F.B Nasir

A Textbook on Automata Theory has been designed for students of computer science. Adopting a comprehensive approach to the subject the book presents various concepts with adequate explanations. The logical and well-structured treatment of the subject promotes better understanding and assimilation. Lucid and user-friendly. The book cover the curricula for M.C.A, B.E. (Computer Science) and M.Sc. (Computer Science) at various universities and gives students a strong foundation for advanced studies in the field.

Key features:
• A brief history of mathematicians and computer scientists
• Notation for describing machine models
• Exercises at the end of each chapter for practice
• Numerous illustrations supporting theoretical inputs
• A wide array of solved examples and applications

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Object - Oriented Programming with Visual Basic.NET
Michael McMillan

Michael McMillan provides a complete presentation of the object-oriented features of the Visual Basic .NET language for advanced Visual Basic programmers. Beginning with an introduction to abstract data types and their initial implementation using structures he explains standard OOP topics including class design inheritance access modifiers and scoping issues abstract classes design and implementation of interfaces and design patterns and refactoring in VB.NET. More advanced OOP topics are included as well such as reflection object persistence and serialization. To tie everything together McMillan demonstrates sound OOP design and implementation principles through practical examples of standard Windows applications database applications using ADO.NET Web-based applications using ASP.NET and Windows service applications.

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Enterprise Cloud Computing
Technology Architecture Applications
Gautam Shroff

Cloud computing promises to revolutionize IT and business by making computing available as a utility over the internet. This book is intended primarily for practising software architects who need to assess the impact of such a transformation. It explains the evolution of the internet into a cloud computing platform describes emerging development paradigms and technologies and discusses how these will change the way enterprise applications should be architected for cloud deployment. Gautam Shroff provides a technical description of cloud computing technologies covering cloud infrastructure and platform services programming paradigms such as MapReduce as well as `do-it-yourself' hosted development tools. He also describes emerging technologies critical to cloud computing. The book also covers the fundamentals of enterprise computing including a technical introduction to enterprise architecture so it will interest programmers aspiring to become software architects and serve as a reference for a graduate-level course in software architecture or software engineering.

Contents:

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Machine learning methods extract value from vast data sets quickly and with modest resources. They are established tools in a wide range of industrial applications including search engines DNA sequencing stock market analysis and robot locomotion and their use is spreading rapidly. People who know the methods have their choice of rewarding jobs. This hands-on text opens these opportunities to computer science students with modest mathematical backgrounds. It is designed for final-year undergraduates and master’s students with limited background in linear algebra and calculus. Comprehensive and coherent it develops everything from basic reasoning to advanced techniques within the framework of graphical models. Students learn more than a menu of techniques they develop analytical and problem-solving skills that equip them for the real world. Numerous examples and exercises both computer based and theoretical are included in every chapter. Resources for students and instructors including a MATLAB toolbox are available online.


Data Structures and Algorithms Using C#

C# programmers: no more translating data structures from C++ or Java to use in your programs! Mike McMillan provides a tutorial on how to use data structures and algorithms plus the first comprehensive reference for C# implementation of data structures and algorithms found in the .NET Framework library as well as those developed by the programmer. The approach is very practical using timing tests rather than Big O notation to analyze the efficiency of an approach. Coverage includes arrays and array lists linked lists hashtables dictionaries trees graphs and sorting and searching algorithms as well as more advanced algorithms such as probabilistic algorithms and dynamic programming. This is the perfect resource for C# professionals and students alike.


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Contents:
- List of figures; Preface;
- Acknowledgements;
- 5. Encryption schemes;
- 6. Digital signatures and message authentication;
- 7. General cryptographic protocols; Appendix C: corrections and additions to volume I;
- Bibliography; Index.

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Mobile Commerce
Opportunities, Applications, and Technologies of Wireless Business
Paul May

This book provides the context, architectures, case studies, and intelligent analysis that will help you grasp this rapidly evolving subject. With keen insight into the needs of both camps, May explains the technological aspects of mobile commerce to business decision makers and the business models to the technologists who design and build these electronic systems. It is the one book all relevant parties in a company can read to ensure common understanding. Topics include devices, technologies, applications, standards, security, and more.


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Modern Compiler Implementation in Java
Appel

This textbook describes all phases of a modern compiler: lexical analysis parsing abstract syntax semantic actions intermediate representations instruction selection via tree matching dataflow analysis graph-coloring register allocation and runtime systems. It includes good coverage of current techniques in code generation and register allocation as well as functional and object-oriented languages that is missing from most books. The most accepted and successful techniques are described in a concise way rather than as an exhaustive catalog of every possible variant. Detailed descriptions of the interfaces between modules of a compiler are illustrated with actual Java classes. The first part of the book Fundamentals of Compilation is suitable for a one-semester first course in compiler design. The second part Advanced Topics which includes the compilation of object-oriented and functional languages garbage collection loop optimizations SSA form loop scheduling and optimization for cache-memory hierarchies can be used as the basis for a second semester or graduate course. A unique feature of the book is a well designed compiler implementation project in Java including front-end and

Contents: Part I. Fundamentals of Compilation:
- 1. Introduction; 2. Lexical analysis; 3. Parsing;
- 17. Dataflow analysis; 18. Loop optimizations;

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More Java Gems presents the best articles and columns published in Java Report between 1997 and 1999. Dwight Deugo Editor of Java Report has carefully selected each article to be independent of any specific version of Java. The material relies mainly on those classes that are now part of the standard Java class library and APIs. Also each article and column discusses Java topics and implementations that are not readily available in a single book. The book serves as an excellent reference to anyone involved with Java. The reader can learn more about the language perform analysis design and modeling work on specific implementations check performance and perform testing. This book presents the good ideas of people who have used Java for ‘real’ applications.


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Through either direct exposure or media coverage of the online world consumers have built certain expectations around interactivity. Activities like email chat and web browsing reinforce popular understanding how people use electronic devices to ‘talk’ ‘find’ and ‘see’ what’s happening in the world around them. Reaching The Interactive Customer describes how these consumer expectations of interactivity impact and shape the new generations of ‘connected’ personal electronics. Reaching The Interactive Customer provides critical information for business professionals who want to understand a ‘connected world’ linking businesses customers and service providers. It describes how the audience for interactive services has evolved and what that audience is looking for in consumer devices. This book also appeals to anyone who works on or is interested in Web-based technology because it paints a clear picture of how interactivity is evolving from the Internet to the next generation of interactivity with phones and televisions.


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More and more working computer professionals are confronted with the use maintenance or customization of cryptographic components and program certification mechanisms for local or mobile code. This text for advanced undergraduate and beginning graduate students tells what every computer scientist ought to know about cryptographic systems security protocols and secure information flow in programs. Highlights include a detailed description of the new advanced encryption standard Rijndael; a complete description of an optimal public-key encryption using RSA which turns ‘textbook RSA’ into a practical implementation; a current and formal discussion of standard security models for information flow in computer programs or human organizations; and a discussion of moral legal and political issues. Another novel feature of the book is the presentation of a formal model-checking tool for specifying and debugging security protocols. The book also includes numerous implementation exercises and programming projects. A supporting web site contains Java source code for the programs featured in the text plus links to other sites including online papers and tutorials offering deeper treatments of the topics presented.

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The Business of Ecommerce
From Corporate Strategy to Technology
Paul May

The Business of Ecommerce provides a guide to the types of business that companies can conduct over the Web and it explains how they can go about building systems to support these initiatives. Business and technology decision-makers will learn all they need to know about the entire field of Ecommerce. Paul May combines his experience as a consultant to blue chip companies with his experience with startups and presents the best of what the two cultures have to offer. He provides a generic model for understanding Ecommerce opportunities and he explores key application areas that readers can exploit in the real world. The book gathers together all of the relevant technologies and makes them accessible to the reader by explaining each of the key technical topics and issues. This book empowers the decision-maker to make better use of the opportunities of Ecommerce.


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The Simplicity Shift
Innovative Design Tactics in a Corporate World
Scott Jenson

High tech products have historically had notoriously poor design. Fortunately companies have recently started to embrace user centered design practices. This transition hasn't been smooth however as many companies have trouble transferring good design into final shipping products. There is a political/cultural disconnect between the corporate desire for good design and the corporate culture that implements it. The Simplicity Shift is about shifting a company's culture to value discover and implement Simplicity creating well designed products. For most companies Product Design is not a first class citizen it is something locked into a 'design department' and done as a subtask of a larger sequential process. For companies to truly create breakthrough easy to use products they must elevate design so that its terms and tools are shared by everyone in the team. Design is a strategic tool that must become a part of how everyone in the company thinks acts and most importantly makes decisions.


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The Standard ML Basis Library
Emden R. Gansner & John H. Reppy (Eds.)

The book provides a description of the Standard ML (SML) Basis Library the standard library for the SML language. For programmers using SML it provides a complete description of the modules types and functions composing the library which is supported by all conforming implementations of the language. The book serves as a programmer's reference providing manual pages with concise descriptions. In addition it presents the principles and rationales used in designing the library and relates these to idioms and examples for using the library. A particular emphasis of the library is to encourage the use of SML in serious system programming. Major features of the library include I/O a large collection of primitive types support for internationalization and a portable operating system interface. This manual will be an indispensable reference for students professional programmers and language designers.


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Data Mining and Analysis
Fundamental Concepts and Algorithms
Mohammed J. Zaki

The fundamental algorithms in data mining and analysis form the basis for the emerging field of data science, which includes automated methods to analyze patterns and models for all kinds of data, with applications ranging from scientific discovery to business intelligence and analytics. This textbook for senior undergraduate and graduate data mining courses provides a broad yet in-depth overview of data mining, integrating related concepts from machine learning and statistics. The main parts of the book include exploratory data analysis, pattern mining, clustering, and classification. The book lays the basic foundations of these tasks, and also covers cutting-edge topics such as kernel methods, high-dimensional data analysis, and complex graphs and networks. With its comprehensive coverage, algorithmic perspective, and wealth of examples, this book offers solid guidance in data mining for students, researchers, and practitioners alike.

Measuring Computer Performance
A Practitioner’s Guide
David J. Lilja

Measuring Computer Performance sets out the fundamental techniques used in analyzing and understanding the performance of computer systems. Throughout the book the emphasis is on practical methods of measurement simulation and analytical modeling. The author discusses performance metrics and provides detailed coverage of the strategies used in benchmark programmes. He gives intuitive explanations of the key statistical tools needed to interpret measured performance data. He also describes the general ‘design of experiments’ technique and shows how the maximum amount of information can be obtained for the minimum effort. The book closes with a chapter on the technique of queuing analysis. Appendices listing common probability distributions and statistical tables are included along with a glossary of important technical terms. This practically-oriented book will be of great interest to anyone who wants a detailed yet intuitive understanding of computer systems performance analysis.


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Foundations and Applications
Leon O. Chua & Tamas Roska

Cellular Nonlinear/neural Network (CNN) technology is both a revolutionary concept and an experimentally proven new computing paradigm. Analogic cellular computers based on CNNs are set to change the way analog signals are processed and are paving the way to an entire new analog computing industry. This unique undergraduate-level textbook includes many examples and exercises including CNN simulator and development software accessible via the Internet. It is an ideal introduction to CNNs and analogic cellular computing for students researchers and engineers from a wide range of disciplines. Although its prime focus is on visual computing the concepts and techniques described in the book will be of great interest to those working in other areas of research including modelling of biological chemical and physical processes.


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Kunal Pimparkhede

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Computer Programs: 200; Practice Questions: 150; Debugging Exercises: 100


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Cloud Computing
Sandeep Bhowmik

The book offers in depth coverage of fundamental concepts including Virtualization, Scaling and Service Oriented Architecture to understand dynamic nature of cloud computing. The text discusses cloud models such as NIST Model, Cloud Deployment Model and Service Delivery Models. The associated techniques like Resource Pooling, Load Balancing, and Content Delivery Network are presented in detail. The book concludes with discussion on popular available commercial cloud services and real life applications including Amazon, Google and Microsoft Azure. It helps the readers to correlate the theory with practically available services.

It follows structured approach to explain the complex topics. Appendices on Mobile Cloud Computing and recent developments including real-time processing and programming in cloud are provided. Plenty of review questions, multiple choice questions, illustrations and comparison charts are interspersed throughout the text. The book is designed for undergraduate and graduate students of computer science engineering, and information technology.


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Fracture Mechanics
Fundamentals and Applications
Surya Kumar Maiti

Fracture mechanics deals with the principles governing the extension of defects like cracks in materials and applications of the principles in design of components of machines and structures, calculation of their life, assessment of their in-service safety and reliability, and prevention of catastrophic failures in service. Divided into nine chapters, the book discusses the fundamental concepts and mathematical foundations of fracture mechanics from the point of view of mechanics. It also discusses the fundamentals of linear elastic fracture mechanics and elastic plastic fracture mechanics, analysis of crack problems, computational issues, mixed mode fracture, fatigue crack growth, experimental methods for measurements of material parameters, and applications of the principles of the subject to design.


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Fundamentals of Engineering Tribology with Applications
Harish Hirani

Tribology is the study of the principles of friction, wear and lubrication of machine elements. As a branch of mechanical engineering and materials science, tribology deals with the design of fluid containment systems like seals and gaskets, and lubrication of surfaces in relative motion. This book discusses the theories and applications of hydrodynamic thrust bearings, gas (air) lubricated bearings and elasto-hydrodynamic lubrication in detail. Explaining the concepts of friction including coefficient of friction, friction instability and stick-slip motion, the book also clarifies the delusion that harder and cleaner surfaces produce better results in wear. The recent developments including Online Condition Monitoring (an integration of moisture sensor, wear debris and oil quality sensors) and Multigrid Technique are also presented in the book. In addition, it provides design problems and their real-life applications for cams, followers, gears and bearings. MATLAB programs, frequently asked and multiple choice questions are interspersed throughout the book for better understanding.


ISBN: 9781107063877 464pp HB ₹ 800.00

Principles and Applications of Metal Rolling
Siddhartha Ray

Continuum Mechanics
Foundations and Applications of Mechanics
C. S. Jog

Continuum mechanics studies the foundations of deformable body mechanics from a mathematical perspective. It also acts as a base upon which other applied areas such as solid mechanics and fluid mechanics are developed. This book discusses some important topics, which have come into prominence in the latter half of the twentieth century, such as material symmetry, frame-indifference and thermomechanics. The study begins with the necessary mathematical background in the form of an introduction to tensor analysis followed by a discussion on kinematics, which deals with purely geometrical notions such as strain and rate of deformation. Moving on to derivation of the governing equations, the book also presents applications in the areas of linear and nonlinear elasticity. In addition, the volume also provides a mathematical explanation to the axioms and laws of deformable body mechanics, and its various applications in the field of solid mechanics.

Engineering chemistry discusses the fundamental theoretical concepts of chemistry and links them with their engineering applications. This book is designed as an introductory course for undergraduate students in all branches of engineering. Employing an easy-to-learn approach, it elaborates the fundamental concepts and their applications, supplemented by scores of illustrations and learning exercises so as to facilitate comprehension.

Beginning with areas of common interest such as fuels, water, corrosion, phase rule and followed by a chapter each on engineering materials, polymers and lubricants, the book discusses a range of important topics like structure and bonding, solid state, liquid crystals, chemical kinetics, surface chemistry, thermodynamics, electrochemistry, spectroscopy, photochemistry, basics of organic chemistry, organometallic compounds, green chemistry, nano-chemistry, environmental science, chemical aspects of biotechnology, analytical techniques in chemistry, the chemistry of carbon and hydrogen compounds, etc.

Supplementary material
- Solution manual for teachers and students
- Model question papers for students

Special features
- Each chapter is supplemented with Summary, Review Questions and Multiple Choice Questions.
- Covers the Engineering Chemistry syllabuses (for first year Engineering students) of all major technical universities and colleges in India


Fluid Mechanics
C. S. Jog

Fluid mechanics is the study of fluids including liquids, gases and plasmas and the forces acting on them. Its study is critical in predicting rainfall, ocean currents, reducing drag on cars and airplanes, and design of engines. The subject is also interesting from a mathematical perspective due to the nonlinear nature of its equations. For example, the topic of turbulence has been a topic of interest to both mathematicians and engineers: to the former because of its mathematically complex nature and to the latter group because of its ubiquitous presence in real-life applications.

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Sales points
- Detailed summary of the most general form of the governing equations and shows how various approximations are made to solve problems of engineering interest.
- It uses numerical/analytical solutions of the gas dynamic equations instead of the classical method of using Gas Tables.
- Presents a large number of applications including poiseuille flow through annular region and wind driven ocean currents.

Contents: List of figures; List of tables; Preface; Notation; 1: Kinematics and governing Equations; 2: Hydrostatics; 3: Ideal fluid flow; 4: Surface waves; 5: Exact solutions to flow problems of an incompressible viscous fluid; 6: Laminar boundary layer theory; 7: Low-reynolds number hydrodynamics; 8: Compressible fluid flow; Appendices; Bibliography; Answers and hints to selected exercises; Index

Engineering mechanics applies the laws of mechanics in design and it lies at the core of every machine designed. It is essential for an engineer to have sound knowledge of the fundamental principles of engineering mechanics and the techniques involved in application. This is a book written for undergraduate students pursuing an engineering course at any university in India or preparing for competitive examinations that require graduate level knowledge. Beginning with the laws of mechanics, equations of equilibrium and free-body diagrams, this book covers a whole gamut of topics such as friction, shear force, bending moment, analysis of plane trusses and frames, centroid, moment of inertia, stress analysis, kinematic analysis, impulse, momentum, energy methods, virtual work, mechanical vibration, torsion of circular shafts, etc.
Crystal Engineering
A Textbook

Gautam R. Desiraju,
Jagadeesh J. Vittal,
Arunachalam Ramanan

This book is important because it is the first textbook in an area that has become very popular in recent times. There are around 250 research groups in crystal engineering worldwide today. The subject has been researched for around 40 years but there is still no textbook at the level of senior undergraduates and beginning PhD students. This book is expected to fill this gap. The writing style is simple, with an adequate number of exercises and problems, and the diagrams are easy to understand. This book consists major areas of the subject, including organic crystals and co-ordination polymers, and can easily form the basis of a 30 to 40 lecture course for senior undergraduates.

Contents: 1) Crystal Engineering: a) X-ray Crystallography; b) Organic Solid State Chemistry; c) The Crystal as a Supramolecular Entity; d) Modern Crystal Engineering; e) Summary; f) Further Reading; g) Problems; 2) Intermolecular Interactions: a) General Properties; b) van der Waals Interactions; c) Hydrogen Bonds; d) Halogen Bonds; e) Other Interactions; f) Methods of Study of Interactions; g) Analysis of Typical Crystal Structures; h) Summary; i) Further Reading; j) Problems; 3) Crystal Design Strategies: a) Synthesis in Chemistry; b) Supramolecular Chemistry; c) The Synthon in Crystal Engineering; d) Summary; e) Further Reading; f) Problems; 4) Crystallization and Crystal Growth: a) Crystallization of Organic Solids; b) Nucleation; c) Thermodynamics and Kinetics of Crystallization; d) Crystal Growth; e) Crystal Morphology and Habit; f) Crystal Morphology Engineering; g) Why is it that all Compounds don’t seem to Crystallize Equally Well or Equally Quickly?; h) Summary; i) Further Reading; j) Problems; 5) Polymorphism: a) What is Polymorphism?; b) Occurrence of Polymorphism; c) Thermodynamics of Polymorphism; d) Thermodynamics versus Kinetics and the Formation of Polymorphs; e) Methods of Polymorph Characterization; f) Properties of Polymorphs; g) Case Studies from the Pharmaceutical Industry; h) Polymorphism Today; i) Summary; j) Further Reading; k) Problems; 6) Multi-component Crystals: a) General Classification and Nomenclature; b) Solid Solutions; c) Host-Guest Compounds; d) Solvates and Hydrates; e) Donor-Acceptor Complexes; f) Co-crystals; g) Summary; h) Further Reading; i) Problems; 7) Coordination Polymers: a) What are Coordination Polymers?; b) Classification Schemes; c) Crystal Design Strategies; d) Network Topologies; e) Supramolecular Isomerism; f) Interpenetration; g) Porous Coordination Polymers; h) Properties and Applications; i) Building Approach: Influence of Experimental Conditions; j) Summary; k) Further Reading; l) Problems

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Digital Image Processing for Medical Applications
Geoff Dougherty

Image processing is a hands-on discipline, and the best way to learn is by doing. This text takes its motivation from medical applications and uses real medical images and situations to illustrate and clarify concepts and to build intuition, insight and understanding. Designed for advanced undergraduates and graduate students who will become end-users of digital image processing, it covers the basics of the major clinical imaging modalities, explaining how the images are produced and acquired. It then presents the standard image processing operations, focusing on practical issues and problem solving. Crucially, the book explains when and why particular operations are done, and practical computer-based activities show how these operations affect real images. All images, links to the public-domain software ImageJ and custom plug-ins, and selected solutions are available from www.cambridge.org/books/dougherty


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372 b/w illus. 13 colour illus.
17 tables 130 exercises
This practical, tool-independent guide to designing digital circuits takes a unique, top-down approach, reflecting the nature of the design process in industry. Starting with architecture design, the book comprehensively explains the why and how of digital circuit design, using the physics designers need to know, and no more. Covering system and component aspects, design verification, VHDL modeling, signal integrity, clocking and more, the scope of the book is uniquely comprehensive. With a focus on CMOS technology, numerous examples - VHDL and Verilog code, architectural concepts, and design checklists, this engaging textbook for senior undergraduate and graduate courses on digital ICs will prepare students for the realities of real-world circuit design. Practitioners will also find the book valuable for its insights and its practical approach. Instructor only solutions and lecture slides are available at: www.cambridge.org/Kaeslin.


ISBN: 9780521127356 866pp PB ₹ 1495.00
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Guru and Hiziroglu have produced an accessible and user-friendly text on electromagnetics that will appeal to both students and professors teaching this course. This lively book includes many worked examples and problems in every chapter, as well as chapter summaries and background revision material where appropriate. The book introduces undergraduate students to the basic concepts of electrostatic and magnetostatic fields, before moving on to cover Maxwell's equations, propagation, transmission and radiation. Chapters on the Finite Element and Finite Difference method, and a detailed appendix on the Smith chart are additional enhancements. MathCad code for many examples in the book and a comprehensive solutions set are available at: www.cambridge.org/9780521830164.


ISBN: 9780521670425 700pp PB ₹ 750.00

The first edition of Caroline Whitbeck’s Ethics in Engineering Practice and Research focused on the difficult ethical problems engineers encounter in their practice and in research. In many ways, these problems are like design problems: they are complex, often ill defined; resolving them involves an iterative process of analysis and synthesis; and there can be more than one acceptable solution. In the second edition of this text, Dr Whitbeck goes above and beyond by featuring more real-life problems, stating recent scenarios and laying the foundation of ethical concepts and reasoning. This book offers a real-world, problem-centered approach to engineering ethics, using a rich collection of open-ended case studies to develop skill in recognizing and addressing ethical issues.


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Fluid Mechanics
David Pnueli & Chaim Gutlinger

This text is intended for the study of fluid mechanics at an intermediate level. However, the presentation starts with basic ideas in order to form a sound conceptual structure that can support engineering applications and encourage further learning. Subjects treated include hydrostatics, viscous flow, similitude and order of magnitude, creeping flow, potential flow, boundary layer flow, turbulent flow, compressible flow, and non-Newtonian fluids.


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305 b/w illus.

Fundamentals of Engineering Numerical Analysis
Parviz Moin

Since the original publication of this book, available computer power has increased greatly. Today, scientific computing is playing an ever more prominent role as a tool in scientific discovery and engineering analysis. In this second edition, the key addition is an introduction to the finite element method. This is a widely used technique for solving partial differential equations (PDEs) in complex domains. This text introduces numerical methods and shows how to develop, analyse, and use them. Complete MATLAB programs for all the worked examples are now available at www.cambridge.org/Moin and more than 30 exercises have been added. This thorough and practical book is intended as a first course in numerical analysis, primarily for new graduate students in engineering and physical science. Along with mastering the fundamentals of numerical methods, students will learn to write their own computer programs using standard numerical methods.


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Fundamentals of Error Correcting Codes
W. Cary Huffman & Vera Pless

Fundamentals of Error Correcting Codes is an in-depth introduction to coding theory from both an engineering and mathematical viewpoint. As well as covering classical topics, much coverage is included of recent techniques which until now could only be found in specialist journals and book publications. Numerous exercises and examples and an accessible writing style make this a lucid and effective introduction to coding theory for advanced undergraduate and graduate students, researchers and engineers, whether approaching the subject from a mathematical, engineering or computer science background.


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This introductory text on air-breathing jet propulsion focuses on the basic operating principles of jet engines and gas turbines. Previous coursework in fluid mechanics and thermodynamics is elucidated and applied to help the student understand and predict the characteristics of engine components and various types of engines and power gas turbines. Numerous examples help the reader appreciate the methods and differing, representative physical parameters. A capstone chapter integrates the text material into a portion of the book devoted to system matching and analysis so that engine performance can be predicted for both on- and off-design conditions. The book is designed for advanced undergraduate and first-year graduate students in aerospace and mechanical engineering. A basic understanding of fluid dynamics and thermodynamics is presumed. Although aircraft propulsion is the focus, the material can also be used to study ground- and marine-based gas turbines and turbomachinery and some advanced topics in compressors and turbines.


ISBN: 9781107646872 658pp PB ₹ 995.00

Introduction to Computational Fluid Dynamics
Anil W. Date

Introduction to Computational Fluid Dynamics is a textbook for advanced undergraduate and first year graduate students in mechanical, aerospace and chemical engineering. The book emphasizes understanding CFD through physical principles and examples. The author follows a consistent philosophy of control volume formulation of the fundamental laws of fluid motion and energy transfer, and introduces a novel notion of ‘smoothing pressure correction’ for solution of flow equations on collocated grids within the framework of the well-known SIMPLE algorithm. The subject matter is developed by considering pure conduction/diffusion, convective transport in 2-dimensional boundary layers and in fully elliptic flow situations and phase-change problems in succession. The book includes chapters on discretization of equations for transport of mass, momentum and energy on Cartesian, structured curvilinear and unstructured meshes, solution of discretised equations, numerical grid generation and convergence enhancement. Practising engineers will find this particularly useful for reference and for continuing education.

Contents: 1. Introduction; 2. 1D heat conduction; 3. 1D conduction-convective; 4. 2D boundary layers; 5. 2D convection-Cartesian grids; 6. 2D convection-complex domains; 7. Phase change; 8. Numerical grid generation; 9. Convergence enhancement.

ISBN: 9780521540858 496pp PB ₹ 595.00

Fundamentals of Modern VLSI Devices
Yuan Taur & Tak H. Ning

His book examines in detail the basic properties and design, including chip integration, of CMOS and bipolar VLSI devices and discusses the various factors that affect their performance. The authors begin with a thorough review of the relevant aspects of semiconductor physics, and proceed to a description of the design of CMOS and bipolar devices. The optimization of these devices for VLSI applications is also covered. The authors highlight the intricate interdependencies and subtle trade-offs between those device parameters, such as power consumption and packing density, that affect circuit performance and manufacturability. They also discuss in detail the scaling, and physical limits to the scaling, of CMOS and bipolar devices. The book contains many exercises, and can be used as a textbook for senior undergraduate or first-year graduate courses on microelectronics or VLSI devices. It will also be a valuable reference volume for practising engineers involved in research and development in the electronics industry.


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From semiconductor fundamentals to state-of-the-art semiconductor devices used in the telecommunications and computing industries, this book provides a solid grounding in the most important devices used in the hottest areas of electronic engineering today. The book includes coverage of future approaches to computing hardware and RF power amplifiers, and explains how emerging trends and system demands of computing and telecommunications systems influence the choice, design and operation of semiconductor devices. The book begins with a discussion of the fundamental properties of semiconductors. Next, state-of-the-art field effect devices are described, including MODFETs and MOSFETs. Short channel effects and the challenges faced by continuing miniaturization are then addressed. The rest of the book discusses the structure, behavior, and operating requirements of semiconductor devices used in high frequency, high power amplifiers for wireless light amplifiers and detectors; 11. Transistors for CMOS; 10. Optoelectronic devices - emitters, photodetectors, and lightwave and wireless telecommunications systems; References; Appendix 1. Physical constants; Appendix 2. Material parameters for important semiconductors, Si and GaAs; Index.


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**Mass and Heat Transfer**

**Analysis of Mass Contactors and Heat Exchangers**

T. W. Fraser Russell, Anne S. Robinson, Norman J. Wagner

This text allows instructors to teach a course on heat and mass transfer that will equip students with the pragmatic, applied skills required by the modern chemical industry. This new approach is a combined presentation of heat and mass transfer, maintaining mathematical rigor while keeping mathematical analysis to a minimum. This allows students to develop a strong conceptual understanding, and teaches them how to become proficient in engineering analysis of mass contactors and heat exchangers and the transport theory used as a basis for determining how critical coefficients depend upon physical properties and fluid motions. Students will first study the engineering analysis and design of equipment important in experiments and for the processing of material at the commercial scale. The second part of the book presents the fundamentals of transport phenomena relevant to these applications. A complete teaching package includes a comprehensive instructor’s guide, exercises, case studies, and project assignments.


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A balanced mechanics-materials approach and coverage of the latest developments in biomaterials and electronic materials, the new edition of this popular text is the most thorough and modern book available for upper-level undergraduate courses on the mechanical behavior of materials. To ensure that the student gains a thorough understanding the authors present the fundamental mechanisms that operate at micro- and nano-meter level across a wide-range of materials, in a way that is mathematically simple and requires no extensive knowledge of materials. This integrated approach provides a conceptual presentation that shows how the microstructure of a material controls its mechanical behavior, and this is reinforced through extensive use of micrographs and illustrations. New worked examples and exercises help the student test their understanding. Further resources for this title, including lecture slides of select illustrations and solutions for exercises, are available online at: www.cambridge.org/9780521866675


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A balanced mechanics-materials approach and coverage of the latest developments in biomaterials and electronic materials, the new edition of this popular text is the most thorough and modern book available for upper-level undergraduate courses on the mechanical behavior of materials. To ensure that the student gains a thorough understanding the authors present the fundamental mechanisms that operate at micro- and nano-meter level across a wide-range of materials, in a way that is mathematically simple and requires no extensive knowledge of materials. This integrated approach provides a conceptual presentation that shows how the microstructure of a material controls its mechanical behavior, and this is reinforced through extensive use of micrographs and illustrations. New worked examples and exercises help the student test their understanding. Further resources for this title, including lecture slides of select illustrations and solutions for exercises, are available online at: www.cambridge.org/9780521866675


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In this revised and enhanced second edition of Optimization Concepts and Applications in Engineering, the already robust pedagogy has been enhanced with more detailed explanations, an increased number of solved examples and end-of-chapter problems. The source codes are now available free on multiple platforms. It is vitally important to meet or exceed previous quality and reliability standards while at the same time reducing resource consumption. This textbook addresses this critical imperative integrating theory, modeling, the development of numerical methods, and problem solving, thus preparing the student to apply optimization to real-world problems. This text covers a broad variety of optimization problems using: unconstrained, constrained, gradient, and non-gradient techniques; duality concepts; multiobjective optimization; linear, integer, geometric, and dynamic programming with applications; and finite element-based optimization. It is ideal for advanced undergraduate or graduate courses and for practising engineers in all engineering disciplines, as well as in applied mathematics.


ISBN: 9780521181945 1004pp PB ₹ 1250.00
Principles of Digital Communication
Robert G. Gallager

The renowned communications theorist Robert Gallager brings his lucid writing style to the study of the fundamental system aspects of digital communication for a one-semester course for graduate students. With the clarity and insight that have characterized his teaching and earlier textbooks, he develops a simple framework and then combines this with careful proofs to help the reader understand modern systems and simplified models in an intuitive yet precise way. A strong narrative and links between theory and practice reinforce this concise, practical presentation. The book begins with data compression for arbitrary sources. Gallager then describes how to modulate the resulting binary data for transmission over wires, cables, optical fibers, and wireless channels. Analysis and intuitive interpretations are developed for channel noise models, followed by coverage of the principles of detection, coding, and decoding. The various concepts covered are brought together in a description of wireless communication, using CDMA as a case study.


ISBN: 9780521182065 422pp PB ₹ 585.00

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Principles of Optimal Design
Modeling and Computation
Panos Y. Papalambros & Douglass J. Wilde

This text discusses modelling for design optimization. It presents a condensed version of classical optimization theory and numerical algorithms, which it integrates with the newer ideas of monotonicity analysis and model boundedness. Careful definition of new concepts and rigorous proof of simple but important principles are followed by immediate applications. It begins with the definition of modelling and the optimization problem and outlines the limitations of this approach. The authors then move on to discuss the important but rarely emphasized concepts of boundedness checking, the idea that the parameters of every model should be verified and simplified; and monotonicity analysis, a method of determining which variables actively constrain a model. Then the discussion turns to the classical theory of differential optimization and hence to powerful numerical optimization techniques. Extensive examples and exercises aid the student and provide practice. A knowledge of differential calculus is helpful.


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Quality and Reliability in Engineering
Chandrupatla Tirupathi R.

Quality and Reliability in Engineering provides an integrated approach to quality specification, quality control and monitoring, and reliability. Examples and exercises stress practical engineering applications. Steps in the development of the theory are implemented in complete, self-contained computer programs. The book serves as a textbook for upper level undergraduate courses in quality and reliability in mechanical engineering, manufacturing engineering, and industrial engineering programs. It can be used as a supplement to upper level capstone design courses, short courses for quality training, and as a learning resource for practising engineers.


ISBN: 9781107687738 326pp PB ₹ 595.00

144 b/w illus.

Remarkable Engineers
From Riquet to Shannon
Ioan James

Engineering transformed the world completely between the 17th and 21st centuries. Remarkable Engineers tells the stories of 51 of the key pioneers in this transformation, from the designers and builders of the world’s railways, bridges and aeroplanes, to the founders of the modern electronics and communications revolutions. The focus throughout is on their varied life stories, and engineering and scientific detail is kept to a minimum. Engineer profiles are organized chronologically, inviting readers with an interest in engineering to follow the path by which these remarkable engineers utterly changed our lives.

Contents: Part I. From Peter Paul Riquet to James Watt: Peter Paul Riquet (1604–1680); Sebastien le Prestre de Vauban (1633–1707); James Brindley (1716–1772); John Smeaton (1724–1792); James Watt (1736–1819); Part II. From William Jessop to Marc Brunel: William Jessop (1745–1814); Lazare Carnot (1753–1823); Thomas Telford (1757–1834); John Rennie (1764–1821); Sir Marc Isambard Brunel (1769–1849); Part III. From Richard Trevithick to Sadi Carnot: Richard Trevithick (1771–1833); Sir George Cayley (1773–1857); George Stephenson (1781–1848); Charles Babbage (1792–1871); Charles Vignoles (1793–1875); Sadi Carnot (1796–1832); Part IV. From Joseph Henry to Sir Joseph William Bazalgette: Joseph Henry (1797–1878); John Ericsson (1803–1899); Robert Stephenson (1803–1859); Isambard Kingdom Brunel (1806–1859); John Roebling (1806–1869); Sir Joseph William Bazalgette (1819–1891); Part V. From James Buchanan Eads to Alexander Graham Bell: James Buchanan Eads (1820–1887); William Thomson (Lord Kelvin) (1824–1907); Gustav Eiffel (1832–1923); George Westinghouse (1846–1914);
Robots for Electronics Manufacturing
Principles and Applications in Cleanroom Automation
Karl Mathia

Understand the design, testing, and application of cleanroom robotics and automation with this practical guide. From the history and evolution of cleanroom automation to the latest applications and industry standards, this book provides the only complete overview of the topic available. With over 20 years' industry experience in robotics design, Karl Mathia provides numerous real-world examples to enable you to learn from professional experience, maximize the design quality and avoid expensive design pitfalls. You'll also get design guidelines and hands-on tips for reducing design time and cost. Compliance with industry and de-facto standards for design, assembly, and handling is stressed throughout, and detailed discussions of recommended materials for atmospheric and vacuum robots are included to help shorten product development cycles and avoid expensive material testing. This book is the perfect practical reference for engineers working with robotics for electronics manufacturing in a range of industries that rely on cleanroom manufacturing.

Contents:

ISBN: 9780521187336 218pp PB ₹ 345.00
48 b/w illus.

Soil Mechanics
A One-Dimensional Introduction
David Muir Wood

This book teaches the principles of soil mechanics to undergraduates, along with other properties of engineering materials, to which the students are exposed simultaneously. Using the critical state method of soil mechanics to study the mechanical behavior of soils requires the student to consider density alongside effective stresses, permitting the unification of deformation and strength characteristics. This unification aids the understanding of soil mechanics. This book explores a one-dimensional theme for the representation of many of the key concepts of soil mechanics - density, stress, stiffness, strength, and fluid flow - and includes a chapter on the analysis of one-dimensional consolidation, which fits nicely with the theme of the book. It also presents some theoretical analyses of soil-structure interaction, which can be analyzed using essentially one-dimensional governing equations. Examples are given at the end of most chapters, and suggestions for laboratory exercises or demonstrations are given.


ISBN: 9780521187305 252pp PB ₹ 495.00
192 b/w illus. 18 tables

An Introduction to Composite Materials
D. Hull & T. W. Clyne

This edition has been greatly enlarged and updated to provide both scientists and engineers with a clear and comprehensive understanding of composite materials. In describing both theoretical and practical aspects of their production properties and usage the book crosses the borders of many disciplines. Topics covered include: fibres matrices laminates and interfaces; elastic deformation stress and strain strength fatigue crack propagation and creep resistance; toughness and thermal properties; fatigue and deterioration under environmental conditions; fabrication and applications. Coverage has been increased to include polymeric metallic and ceramic matrices and reinforcement in the form of long fibres short fibres and particles. Designed primarily as a teaching text for final-year undergraduates in materials science and engineering this book will also interest undergraduates and postgraduates in chemistry physics and mechanical engineering. In addition it will be an excellent source book for academic and technological researchers on materials.


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Thomas Alva Edison (1847–1931); Alexander Graham Bell (1847–1922); Part VI. From Ferdinand Braun to Heinrich Hertz: Ferdinand Braun (1850–1918); Hertha Ayrton (1854–1923); Charles Parsons (1854–1931); Granville Woods (1856–1910); Nikola Tesla (1856–1943); Heinrich Hertz (1857–1894); Part VII. From Rudolf Diesel to Guglielmo Marconi: Rudolf Diesel (1858–1913); Elmer Sperry (1860–1930); Wilbur Wright (1867–1912) and Orville Wright (1871–1948); Frederick Lanchester (1868–1946); Guglielmo Marconi (1874–1937); Part VIII. From Dennis Gabor to Claude Pal'chinskii: Dennis Gabor (1900–1979); Sergei Marconi (1874–1937); Part IX. From Dennis Gabor to Claude Pal'chinskii to Vladimir Zworykin: Peter Pal'chinskii (1875–1929); Edith Clarke (1883–1918); Andrei Tupolev (1888–1972); John Logie Baird (1888–1946); Vladimir Zworykin (1889–1982); Part IX. From Dennis Gabor to Claude Shannon: Dennis Gabor (1900–1979); Sergei Pavlovich Korolev (1906–1966); Frank Whittle (1907–1996); William Shockley (1910–1989); Wernher von Braun (1912–1977); Claude Shannon (1916–2001).
Analytic Combustion
With Thermodynamics, Chemical Kinetics and Mass Transfer
Date Anil W.

Combustion involves change in the chemical state of a substance from a fuel-state to a product-state via chemical reaction accompanied by release of heat energy. Design or performance evaluation of equipment also requires knowledge of the rate of change of state. This rate is governed by the laws of thermodynamics and by the empirical sciences of heat and mass transfer, chemical kinetics and fluid dynamics. Analytic Combustion is written for advanced undergraduates, graduate students and professionals in mechanical, aeronautical and chemical engineering. Topics were carefully selected and presented to facilitate learning with emphasis on effective mathematical formulations and solution strategies. The book features over 60 solved numerical problems and analytical derivations and nearly 145 end-of-chapter exercise problems. The presentation is gradual, starting from thermodynamics of pure and mixture substances, and chemical equilibrium, building to a uniquely strong chapter on application case studies.


ISBN: 9781107655287 366pp PB ₹ 595.00
87 b/w illus. 91 tables 152 exercises

The Design of CMOS Radio Frequency Integrated Circuits
Second Edition
Thomas H. Lee

This book, first published in 2004, is an expanded and thoroughly revised edition of Tom Lee’s acclaimed guide to the design of gigahertz RF integrated circuits. A new chapter on the principles of wireless systems provides a bridge between system and circuit issues. The chapters on low-noise amplifiers, oscillators and phase noise have been significantly expanded. The chapter on architectures now contains several examples of complete chip designs, including a GPS receiver and a wireless LAN transceiver, that bring together the theoretical and practical elements involved in producing a prototype chip. Every section has been revised and updated with findings in the field and the book is packed with physical insights and design tips, and includes a historical overview that sets the whole field in context. With hundreds of circuit diagrams and homework problems this is an ideal textbook for students taking courses on RF design and a valuable reference for practising engineers.


ISBN: 9781107616738 1008pp PB ₹ 995.00
400 colour illus.

Applied Digital Signal Processing
Theory and Practice
Dimitris G. Manolakis & Vinay K. Ingle

Master the basic concepts and methodologies of digital signal processing with this systematic introduction, without the need for an extensive mathematical background. The authors lead the reader through the fundamental mathematical principles underlying the operation of key signal processing techniques, providing simple arguments and cases rather than detailed general proofs. Coverage of practical implementation, discussion of the limitations of particular methods and plentiful MATLAB illustrations allow readers to better connect theory and practice. A focus on algorithms that are of theoretical importance or useful in real-world applications ensures that students cover material relevant to engineering practice, and equips students and practitioners alike with the basic principles necessary to apply DSP techniques to a variety of applications. Chapters include worked examples, problems and computer experiments, helping students to absorb the material they have just read. Lecture slides for all figures and solutions to the numerous problems are available to instructors.


ISBN: 9780521613897 816pp PB ₹ 795.00
562 b/w illus. 30 tables 185 exercises
This practically-oriented, all-inclusive guide covers all the major enabling techniques for current and next-generation cellular communications and wireless networking systems. Technologies covered include CDMA, OFDM, UWB, turbo and LDPC coding, smart antennas, wireless ad hoc and sensor networks, MIMO, and cognitive radios, providing readers with everything they need to master wireless systems design in a single volume. Uniquely, a detailed introduction to the properties, design, and selection of RF subsystems and antennas is provided, giving readers a clear overview of the whole wireless system. It is also the first textbook to include a complete introduction to speech coders and video coders used in wireless systems. Richly illustrated with over 400 figures, and with a unique emphasis on practical and state-of-the-art techniques in system design, rather than on the mathematical foundations, this book is ideal for graduate students and researchers in wireless communications, as well as for wireless and telecom engineers.


ISBN: 9780521187367 1020pp PB ₹ 1245.00
345 b/w illus. 24 tables 292 exercises

Ideal for a one-semester course, this concise textbook covers basic electronics for undergraduate students in science and engineering. Beginning with the basics of general circuit laws and resistor circuits to ease students into the subject, the textbook then covers a wide range of topics, from passive circuits through to semiconductor-based analog circuits and basic digital circuits. Using a balance of thorough analysis and insight, readers are shown how to work with electronic circuits and apply the techniques they have learnt. The textbook’s structure makes it useful as a self-study introduction to the subject. All mathematics is kept to a suitable level, and there are several exercises throughout the book. Password-protected solutions for instructors, together with eight laboratory exercises that parallel the text, are available online at: www.cambridge.org/Eggleston.


ISBN: 9781107696785 266pp PB ₹ 495.00
305 b/w illus. 83 exercises

This book presents the fundamental principles and applications of electromagnetic theory, with emphasis on applications in communications. The underlying theory for technological advances like medium and short wave communication, cellular communication, radar, satellite communication, laser and optical communication, remote sensing and geological and earth observing applications have been explained lucidly.


ISBN: 9788175965447 115pp PB ₹ 445.00

This is the thoroughly revised and updated second edition of the hugely successful The Art of Electronics. Widely accepted as the single authoritative text and reference on electronic circuit design, both analog and digital, the original edition sold over 125,000 copies worldwide and was translated into eight languages. The book revolutionized the teaching of electronics by emphasizing the methods actually used by circuit designers – a combination of some basic rules, thumb rules to thumb, and a large nonmathematical treatment that encourages circuit values and performance.


ISBN: 9780521889175 1148pp PB ₹ 995.00

Wireless Communications
Andrea Goldsmith

Wireless technology is a truly revolutionary paradigm shift, enabling multimedia communications between people and devices from any location. It also underpins exciting applications such as sensor networks, smart homes, telemedicine, and automated highways. This book provides a comprehensive introduction to the underlying theory, design techniques and analytical tools of wireless communications, focusing primarily on the core principles of wireless system design. The book begins with an overview of wireless systems and standards. The characteristics of the wireless channel are then described, including their fundamental capacity limits. Various modulation, coding, and signal processing schemes are then discussed in detail, including state-of-the-art adaptive modulation, multicarrier, spread spectrum, and multiple antenna techniques. The concluding chapters deal with multiuser communications, cellular system design, and ad-hoc network design. Design insights and tradeoffs are emphasized throughout the book. It contains many worked examples, over 200 figures, almost 300 homework exercises, over 700 references, and is an ideal textbook for students. The book is also a valuable reference for engineers in the wireless industry.


Fundamentals of Wireless Communication
David Tse & Pramod Viswanath

The past decade has seen many advances in physical layer wireless communication theory and their implementation in wireless systems. This textbook takes a unified view of the fundamentals of wireless communication and explains the web of concepts underpinning these advances at a level accessible to an audience with a basic background in probability and digital communication. Topics covered include MIMO (multi-input, multi-output) communication, space-time coding, opportunistic communication, OFDM and CDMA. The concepts are illustrated using many examples from real wireless systems such as GSM, IS-95 (CDMA), IS-856 (1 x EV-DO), Flash OFDM and UWB (ultra-wideband). Particular emphasis is placed on the interplay between concepts and their implementation in real systems. An abundant supply of exercises and figures reinforce the material in the text. This book is intended for use on graduate courses in electrical and computer engineering and will also be of great interest to practicing engineers.

### A Guide to MATLAB
For Beginners and Experienced Users
Third Edition
Brian R. Hunt, Ronald L. Lipsman & Jonathan M. Rosenberg

This edition has been greatly enlarged and updated to provide both scientists and engineers with a clear and comprehensive understanding of composite materials. In describing both theoretical and practical aspects of their production, properties and usage, the book crosses the borders of many disciplines. Topics covered include: fibres, matrices, laminates and interfaces; elastic deformation, stress and strain, strength, fatigue, crack propagation and creep resistance; toughness and thermal properties; fatigue and deterioration under environmental conditions; fabrication and applications. Coverage has been increased to include polymeric, metallic and ceramic matrices and reinforcement in the form of long fibres, short fibres and particles. Designed primarily as a teaching text for final-year undergraduates in materials science and engineering, this book will also interest undergraduates and postgraduates in chemistry, physics, and mechanical engineering. In addition, it will be an excellent source book for academic and technological researchers on materials.


ISBN: 9781107175174 256pp HB  ₹ 695.00

### Digital Signal Processing
Theory and Practice
D Sundararajan

This concise and clear text is intended for a senior undergraduate and graduate level one-semester course on digital signal processing. Emphasis on the use of the discrete Fourier transform (the heart of practical digital signal processing) and comprehensive coverage of the design of commonly used digital filters are the key features of the book. The large number of visual aids such as figures flow graphs and tables makes the mathematical topic easy to learn. The numerous examples and the set of Matlab programs (a supplement to the book) for the design of optimal equiripple FIR digital filters help greatly in understanding the theory and algorithms.

**Contents:** Discrete Signals; 1. Time-Domain Analysis of LTI Discrete Systems; 2. The Discrete Fourier Transform; 3. The Discrete-Time Fourier Transform; 4. The z-Transform; 5. Frequency-Domain Analysis of Discrete Systems; 6. Digital Filters Characterization and Realization; 7. Linear-Phase FIR Filters I; 8. Linear-Phase FIR Filters II; 9. IIR Filters; 10. Computation of the DFT; 11. Quantization Effects

ISBN: 9781107596721 292pp PB  ₹ 395.00

### Mobile Wireless Communications
Mischa Schwartz

Wireless communication has become a ubiquitous part of modern life from global cellular telephone systems to local and even personal-area networks. This book provides a tutorial introduction to digital mobile wireless networks illustrating theoretical underpinnings with a wide range of real-world examples. The book begins with a review of propagation phenomena and goes on to examine channel allocation modulation techniques multiple access schemes and coding techniques. GSM and IS-95 systems are reviewed and 2.5G and 3G packet-switched systems are discussed in detail. Performance analysis and accessing and scheduling techniques are covered and the book closes with a chapter on wireless LANs and personal-area networks. Many worked examples and homework exercises are provided and a solutions manual is available for instructors. The book is an ideal text for electrical engineering and computer science students taking courses in wireless communications. It will also be an invaluable reference for practising engineers.

**Contents:** 1. Introduction and overview; 2. Characteristics of the mobile radio environment - propagation phenomena; 3. Cellular concept and channel allocation; 4. Dynamic channel allocation and power control; 5. Modulation

ISBN: 9781107175174 256pp HB  ₹ 695.00
Providing the underlying principles of digital communication and the design techniques of real-world systems this textbook prepares senior undergraduate and graduate students for the engineering practices required in industry. Covering the core concepts including modulation demodulation equalization and channel coding it provides step-by-step mathematical derivations to aid understanding of background material. In addition to describing the basic theory the principles of system and subsystem design are introduced enabling students to visualize the intricate connections between subsystems and understand how each aspect of the design supports the overall goal of achieving reliable communications. Throughout the book theories are linked to practical applications with over 250 real-world examples whilst 370 varied homework problems in three levels of difficulty enhance and extend the text material. With this textbook students can understand how digital communication systems operate in the real world.

Contents:

ISBN: 9780521146326 668pp PB ₹ 895.00
314 b/w illus. 47 tables 370 exercises


ISBN: 97805211146326 PB ₹ 795.00

Developed out of a successful professional engineering course this practical handbook provides a comprehensive explanation of the Wideband CDMA (Code Division Multiple Access) air interface of 3rd generation UMTS cellular systems. The book addresses all aspects of the design of the WCDMA radio interface from the lower layers to the upper layers of the protocol architecture. The book considers each of the layers in turn to build a complete understanding of the design and operation of the WCDMA radio interface including the physical layer RF and baseband processing MAC RLC PDCP/BMP Non-Access stratum and RRC. An ideal course book and reference for professional engineers undergraduate and graduate students.


ISBN: 9780521670371 592pp PB ₹ 595.00

This textbook provides an in-depth discussion on the basic principles and theories of engineering physics. The book is written in an easy-to-understand manner to offer a balance between theoretical concepts and their applications. The book begins with a comprehensive discussion on oscillations and waves with applications in the field of mechanical and electrical engineering. It then goes on to explain basic concepts of physics including Huygen's principle, Fresnel's biprism, Fraunhofer diffraction and polarization. All the chapters are interspersed with rich pedagogical features including solved problems, unsolved exercises and multiple choice questions with answers to help students in learning and assessing the concepts of engineering physics.

This textbook is primarily meant for undergraduate students of engineering for an introductory course on engineering physics. The book will be supplemented with rich teaching resources including solution manual for the instructors and an accompanying website. The website will offer model question papers for the students.


ISBN: 9781316635643 800pp PB ₹ 450.00
This textbook is a follow-up to the first volume and both are being syndicated together. It begins by explaining fundamental concepts of crystal structure including lattice directions and planes, atomic packing factor, diffraction by crystal, reciprocal lattice and intensity of diffracted beam. It then goes on to comprehensively discuss chapters such as defects in crystals, X-rays, bonding in solids and magnetic properties of materials. The book covers important topics related to superconductivity, optoelectronic devices, dielectric materials, semiconductors, electron theory of solids and energy bands in solids. Solved problems, unsolved exercised and multiple choice questions with answers are included in all the chapters to help students learn and assess the concepts. This textbook is primarily meant for undergraduate students of engineering for an introductory course on engineering physics. The book will be supplemented with rich teaching resources including solution manual for the instructors and an accompanying website. The website will offer model question papers for the students.


ISBN: 9781316876978 600pp PB ₹ 350.00

Wireless sensor networks promise an unprecedented fine-grained interface between the virtual and physical worlds. They are one of the most rapidly developing information technologies with applications in a wide range of fields including industrial process control security and surveillance environmental sensing and structural health monitoring. Originally published in 2005 this book provides a detailed and organized survey of the field. It shows how the core challenges of energy efficiency robustness and autonomy are addressed in these systems by networking techniques across multiple layers. The topics covered include network deployment localization time synchronization wireless radio characteristics medium-access topology control routing data-centric techniques and transport protocols. Ideal for researchers and designers seeking to create algorithms and protocols and engineers implementing integrated solutions it also contains many exercises and can be used by graduate students taking courses in networks.


ISBN: 9781107439870 216pp PB ₹ 495.00

Next Generation Wireless LANs
802.11n and 802.11ac
Eldad Perahia & Robert Stacey

If you’ve been searching for a way to get up to speed on IEEE 802.11n and 802.11ac WLAN standards without having to wade through the entire specification then look no further. This comprehensive overview describes the underlying principles implementation details and key enhancing features of 802.11n and 802.11ac. For many of these features the authors outline the motivation and history behind their adoption into the standard. A detailed discussion of key throughput robustness and reliability enhancing features (such as MIMO multi-user MIMO 40/80/160 MHz channels transmit beamforming and packet aggregation) is given plus clear summaries of issues surrounding legacy interoperability and coexistence. Now updated and significantly revised this 2nd edition contains new material on 802.11ac throughput including revised chapters on MAC and interoperability plus new chapters on 802.11ac PHY and multi-user MIMO. An ideal reference for designers of WLAN equipment network managers and researchers in the field of wireless communications.


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Introduction to Space-Time Wireless Communications
Arogyaswami Paulraj, Rohit Nabar & Dhananjay Gore


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Principles of Engineering Physics 2
Md Khan and S. Panigrahi

Networks and Networking
Bhaskar Krishnamachari

Introduction to Space-Time Wireless Communications
Arogyaswami Paulraj, Rohit Nabar & Dhananjay Gore

The most rapidly developing information technologies with applications in a wide range of fields including industrial process control security and surveillance environmental sensing and structural health monitoring. Originally published in 2005 this book provides a detailed and organized survey of the field. It shows how the core challenges of energy efficiency robustness and autonomy are addressed in these systems by networking techniques across multiple layers. The topics covered include network deployment localization time synchronization wireless radio characteristics medium-access topology control routing data-centric techniques and transport protocols. Ideal for researchers and designers seeking to create algorithms and protocols and engineers implementing integrated solutions it also contains many exercises and can be used by graduate students taking courses in networks.


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ISBN: 9781107447417 308pp PB ₹ 795.00
Principles of Cognitive Radio
Ezio Biglieri, Andrea J. Goldsmith, Larry J. Greenstein, Narayan B. Mandayam & H. Vincent Poor

Widely regarded as one of the most promising emerging technologies for driving the future development of wireless communications, cognitive radio has the potential to mitigate the problem of increasing radio spectrum scarcity through dynamic spectrum allocation. Drawing on fundamental elements of information theory, network theory, propagation optimisation and signal processing, a team of leading experts present a systematic treatment of the core physical and networking principles of cognitive radio and explore key design considerations for the development of new cognitive radio systems.


ISBN: 9781107439900 321pp PB ₹ 695.00

75 b/w illus. 1 table

Convective Heat and Mass Transfer
S. Mostafa Ghiaasiaan

This book was developed during Professor Ghiaasiaan’s twelve years of teaching a graduate-level course on convection heat and mass transfer. It is ideal for a graduate course covering the theory and practice of convection heat and mass transfer. The book treats well-established theory and practice but is also enriched by its coverage of modern areas such as flow in microchannels, computational fluid dynamics-based design and analysis methods. Primarily concerned with convection heat transfer, with the essentials of mass transfer also covered, the mass transfer material and problems are presented in such a way that they can be skipped if not required. The book is richly enhanced by examples and end-of-chapter exercises. A complete solutions manual is available to qualified instructors. The book includes eighteen appendices providing compilations of most essential property and mathematical information for analysis of convective heat and mass transfer processes.


ISBN: 9781107511811 528pp PB ₹ 895.00

140 b/w illus. 34 tables 147 exercises

Earthquake-Resistant Design of Masonry Buildings
Miha Tomazevic

In the last few decades a considerable amount of experimental and analytical research on the seismic behaviour of masonry walls and buildings has been carried out. The investigations resulted in the development of methods for seismic analysis and design as well as new technologies and construction systems. After many centuries of traditional use and decades of allowable stress design clear concepts for limit state verification of masonry buildings under earthquake loading have recently been introduced in codes of practice. Although this book is not a review of the state-of-the-art of masonry structures in earthquake zones, an attempt has been made to balance the discussion on recent code requirements and the author's research work in order to render the book useful for a broader application in design practice. An attempt has also been made to present in a condensed but easy to understand way all the information needed for earthquake-resistant design of masonry buildings constructed using traditional systems. The basic concepts of limit state verification are presented and equations for seismic resistance verification of masonry walls of all types of construction (unreinforced confined and reinforced) as well as masonry-infilled reinforced concrete frames are addressed. A method for seismic resistance verification compatible with recent code requirements is also discussed. In all cases experimental results are used to explain the proposed methods and equations. An important part of this book is dedicated to the discussion of the problems of repair, retrofit and rehabilitation of existing masonry buildings including historical structures in urban centres. Methods of strengthening masonry walls as well as improving the structural integrity of existing buildings are described in detail. Wherever possible experimental evidence regarding the effectiveness of the proposed strengthening methods is given.


ISBN: 9788175969018 280pp HB ₹ 595.00
This book studies the fundamentals of work study and ergonomics in a single volume. The text helps in better understanding of ergonomics principles including string diagram, method study, work sampling and man machine system. It examines theories of human physiology and cognitive sciences and evaluates application of these concepts in designing work environments that optimizes the potential of the worker and reduces the threats of workrelated disorders. It explains tools and techniques including biomechanics, work posture assessment tools, anthropometry and work physiology.

Multiple choice questions, exercises and case studies are interspersed throughout the book for easy understanding and better assessment. The book will be accompanied with rich teaching resources including solution manual for the instructors. The book will be useful for undergraduate students of mechanical, industrial and production engineering.

Contents:

Contents:

Contents:
Analysis of Aircraft Structures
An Introduction
Donaldson Bruce K.

As with the first edition this text provides a clear introduction to the fundamental theory of structural analysis as applied to vehicles aircraft spacecraft automobiles and ships. The emphasis is on the application of fundamental concepts of structural analysis in everyday engineering practice. No assumptions are made with regard to the method of analysis. All approximations are accompanied by a full explanation of their validity. Repetition is an important learning tool and so some redundancy appears to dispel misunderstanding. The number of topics covered in detail is limited to those essential for modern structural engineering practice. In this new edition more topics figures examples and exercises have been added. A primary change has been a greater emphasis on the finite element methods of analysis. Three new chapters are now included and clarity remains the hallmark of this text.


ISBN: 9781107638167 974pp PB ₹ 795.00
20 tables 437 exercises

Cracking the Ad Code
Jacob Goldenberg, David Mazursky, Amnon Levav, Sorin Solomon

Do you need to produce successful creative ideas in advertising? If so then you need this book. For the first time the secret of inventing new creative campaigns is unlocked and practical tools are presented to allow quick production of creative ideas in marketing communications. Along with over 100 advertisement examples and numerous case studies you also get a systematic analysis of the creation aspect of advertising together with a taste of the real world of advertising and what makes it work. Marketing professionals in companies will learn what to expect from their agencies whilst agencies will be able to explain their work to clients in an analytic language that is easily understood. This is essential reading for advertising professionals working for agencies and in marketing and communication departments. It is also a useful tool for students of advertising marketing communication and management from introductory level up to research faculty.


ISBN: 9781107646476 178pp PB ₹ 395.00
131 b/w illus.

Random Wireless Networks
An Information Theoretic Perspective
Rahul Vaze

This book discusses the theoretical limits of information transfer in random wireless networks or ad hoc networks, where nodes are distributed uniformly random in space and there is no centralized control. It provides a detailed analysis of the two relevant notions of capacity for random wireless networks: transmission capacity and throughput capacity. The book starts with the transmission capacity framework that is first presented for the single-hop model and later extended to the multi-hop model with retransmissions. Reusing some of the tools developed for analysis of transmission capacity, few key long-standing questions about the performance analysis of cellular networks are also provided for the benefit of students. The discussion goes further into the concept of hierarchical cooperation that allows throughput capacity to scale linearly with the number of nodes. The author finally discusses the concept of hierarchical cooperation that allows throughput capacity to scale linearly with the number of nodes.


ISBN: 9781107102323 146pp HB ₹ 850.00
Relay Autotuning for Identification and Control

M. Chidambaram, Vivek Sathe

Proportional-integral-derivative (PID) controllers are extensively used for efficient industrial operations. Autotuning such controllers is required for efficient operation. There are two ways of relay autotuning cascade control system simultaneous tuning and sequential tuning. This book discusses incorporation of higher order harmonics of relay autotuning for a single loop controller and cascade control systems to get accurate values of controller ultimate gain. It provides a simple method of designing P/PI controllers for series and parallel cascade control schemes. The authors also focus on estimation of model parameters of unstable FOPTD systems stable SOPTD and unstable SOPTDZ system using a single relay feedback test. The methodology and final results explained in this book are useful in tuning controllers. The text would be of use to graduate students and researchers for further studies in this area. Key features • Focuses on Proportional-Integral-Derivative (PID) controllers extensively used for efficient industrial operations • Examines the working of PID tuning • Provides a simple method of designing P/PI controllers • Includes simulation examples for conceptual clarity


ISBN: 9781107058712 286pp HB ₹ 995.00

Optimization in Chemical Engineering

Suman Dutta

Optimization is used to determine the most appropriate value of variables under given conditions. The primary focus of using optimization techniques is to measure the maximum or minimum value of a function depending on the circumstances. This book discusses problem formulation and problem solving with the help of algorithms such as secant method, quasi-Newton method, linear programming and dynamic programming. It also explains important chemical processes such as fluid flow systems, heat exchangers, chemical reactors and distillation systems using of solved examples.

The book begins by explaining the fundamental concepts followed by an elucidation of various modern techniques including trust-region methods, Levenberg-Marquardt algorithms, stochastic optimization, simulated annealing and statistical optimization. It studies the multi-objective optimization technique and its applications in chemical engineering and also discusses the theory and applications of various optimization software tools including LINGO, MATLAB, MINITAB and GAMS.


ISBN: 9781107091238 382pp HB ₹ 750.00

Jet Propulsion

A Simple Guide to the Aerodynamic and Thermodynamic Design and Performance of Jet Engines

Nicholas Cumpsty

This is the second edition of Cumpsty's excellent self-contained introduction to the aerodynamic and thermodynamic design of modern civil and military jet engines. Through two engine design projects first for a new large passenger aircraft and second for a new fighter aircraft the text introduces illustrates and explains the important facets of modern engine design. Individual sections cover aircraft requirements and aerodynamics principles of gas turbines and jet engines elementary compressible fluid mechanics bypass ratio selection scaling and dimensional analysis turbine and compressor design and characteristics design optimization and off-design performance. The book emphasises principles and ideas with simplification and approximation used where this helps understanding. This edition has been thoroughly updated and revised and includes a new appendix on noise control and an expanded treatment of combustion emissions. Suitable for student courses in aircraft propulsion but also an invaluable reference for engineers in the engine and airframe industry.
Signals and Systems
Principles and Applications
Shaila Dinkar Apte


ISBN: 9781107447325 318pp PB ₨ 895.00
143 b/w illus.

The book is intended to provide rigorous treatment of deterministic and random signals. It offers detailed information on topics including random signals, system modelling and system analysis, correlation and spectral density. System Analysis in Frequency Domain using Fourier Transform and Laplace transform is explained with adequate theory and numerical problems. The advanced techniques used for signal processing especially for speech and image processing are discussed. The properties of Continuous Time and Discrete Time signals are explained with a number of numerical problems. The physical significance of different properties is explained using real life examples.

For better understanding of the concepts, concept check questions, review questions, Summary of important concepts and frequently asked questions are included in the text. The MATLAB programs, its output plots and simulation examples are provided for each concept. The students can execute these simulations and verify the outputs. This text will provide solid foundation for specialized courses in signal processing for the undergraduate and graduate students.


ISBN: 9781316615393 580pp PB ₨ 695.00

Fundamentals of Modelling and Analysing Engineering Systems
Philip D. Cha, James J. Rosenberg, Clive L. Dym


ISBN: 9780521675932 488pp PB ₨ 795.00
304 b/w illus. 6 tables
Electrical Circuits

An Introduction
K. C. A. Smith
& R. E. Alley

This 1992 book provides a comprehensive introduction to the theory of electrical circuits for students in the physical sciences taking a first course in electronics. The methods of circuit analysis are clearly explained and illustrated with the aid of numerous worked examples. Applications of the theory relevant to the fields of electronics, telecommunications and power systems are treated throughout. These sections will prepare students for more advanced courses. The text is written for first and second year undergraduate courses in electronics for science and engineering students. The more specialised sections also provide some advanced material which is covered in third year courses.


ISBN: 9781107503298 596pp PB ₹ 795.00

Chemical Engineering

An Introduction
Denn Morton M.

Chemical engineering is the field of applied science that employs physical chemical and biological rate processes for the betterment of humanity. This opening sentence of Chapter 1 has been the underlying paradigm of chemical engineering. Chemical Engineering: A New Introduction is designed to enable the student to explore the activities in which a modern chemical engineer is involved by focusing on mass and energy balances in liquid-phase processes. Problems explored include the design of a feedback level controller membrane separation hemodialysis optimal design of a process with chemical reaction and separation washout in a bioreactor kinetic and mass transfer limits in a two-phase reactor and the use of the membrane reactor to overcome equilibrium limits on conversion. Mathematics is employed as a language at the most elementary level. Professor Morton M. Denn incorporates design meaningfully; the design and analysis problems are realistic in format and scope. Students using this text will appreciate why they need the courses that follow in the core curriculum.


ISBN: 9781107698727 278pp PB ₹ 395.00

104 b/w illus. 38 tables 87 exercises

Modern Coding Theory

Tom Richardson & Rudiger Urbanke

Having trouble deciding which coding scheme to employ how to design a new scheme or how to improve an existing system? This summary of the state-of-the-art in iterative coding makes this decision more straightforward. With emphasis on the underlying theory techniques to analyse and design practical iterative coding systems are presented. Using Gallager's original ensemble of LDPC codes the basic concepts are extended for several general codes including the practically important class of turbo codes. The simplicity of the binary erasure channel is exploited to develop analytical techniques and intuition which are then applied to general channel models. A chapter on factor graphs helps to unify the important topics of information theory coding and communication theory. Covering the most recent advances this text is ideal for graduate students in electrical engineering and computer science and practitioners. Additional resources including instructor's solutions and figures available online: www.cambridge.org/9780521852296.

Diffusion
Mass Transfer in Fluid Systems
E.L. Cussler

This overview of diffusion and separation processes brings unsurpassed engaging clarity to this complex topic. Diffusion is a key part of the undergraduate chemical engineering curriculum and at the core of understanding chemical purification and reaction engineering. This spontaneous mixing process is also central to our daily lives with importance in phenomena as diverse as the dispersal of pollutants to digestion in the small intestine. For students Diffusion goes from the basics of mass transfer and diffusion itself with strong support through worked examples and a range of student questions. It also takes the reader right through to the cutting edge of our understanding and the new examples in this third edition will appeal to professional scientists and engineers. Retaining the trademark enthusiastic style the broad coverage now extends to biology and medicine.

ISBN: 9780521165761 590pp PB ₹ 795.00
150 b/w illus. 185 exercises

Smart Structures
Analysis and Design
A. V. Srinivasan & D. Michael McFarland

Smart structures and structural components have unusual abilities: they can sense a change in temperature pressure or strain; diagnose a problem; and initiate an appropriate action in order to preserve structural integrity and continue to perform their intended functions. Smart structures can also store processes in memory and learn to repeat the actions taken. Among the many applications are aircraft sensors that warn of impending cracks and medical devices that monitor blood sugar and deliver insulin. This text provides the basic information needed to analyze and design smart devices and structures. Among topics covered are piezoelectric crystals shape memory alloys electrorheological fluids vibration absorber fiber optics and mistuning. A final chapter offers an intriguing view of biomimetics and design strategies that can be incorporated at the microstructural level deriving inspiration from biological structures. The design of smart structures is at the cutting edge of engineering research and development and there is a great need for an introductory book on the subject. This book will be welcomed by both students and practising engineers.


ISBN: 9780521154383 242pp PB ₹ 345.00
161 b/w illus. 13 tables

Communication technology has become pervasive in the modern world and ever more complex. Focusing on the most basic ideas this carefully paced logically structured textbook is packed with insights and illustrative examples making this an ideal introduction to modern digital communication. Examples with step-by-step solutions help with the assimilation of theoretical ideas and MATLAB exercises develop confidence in applying mathematical concepts to real-world problems. Right from the start the authors use the signal space approach to give students an intuitive feel for the modulation/demodulation process. After a review of signals and random processes they describe core topics such as source coding baseband transmission modulation and synchronization. The book closes with coverage of advanced topics such as trellis-coding CDMA and space-time codes to stimulate further study. This is an ideal textbook for anyone who wants to learn about modern digital communication.


ISBN: 9781107652804 562pp PB ₹ 695.00
17 tables 286 exercises

A First Course in Digital Communications
Ha H. Nguyen, Ed Shwedyk

ISBN: 9780521138741 647pp HB ₹ 895.00
199 b/w illus.
Digital Signal Processing
System Analysis and Design
Paulo S. R. Diniz, Eduardo A. B. da Silva, Sergio L. Netto

The principles of signal processing are fundamental to the operation of many everyday devices. This book introduces the basic theory of digital signal processing with emphasis on real-world applications. Sampling quantisation the Fourier transform filters Bayesian methods and numerical considerations are covered then developed to illustrate how they are used in audio image and video processing and compression and in communications. The book concludes with methods for the efficient implementation of algorithms in hardware and software. Intuitive arguments rather than mathematical ones are used wherever possible and links between various signal processing techniques are stressed. The advantages and disadvantages of different approaches are presented in the context of real-world examples enabling the reader to choose the best solution to a given problem. With over 200 illustrations and over 130 exercises (including solutions) this book will appeal to practitioners working in signal processing and undergraduate students of electrical and computer engineering.


ISBN: 9780521158732 348pp PB ₹ 595.00

Optical Switching Networks
Martin Maier

Optical Switching Networks describes all the major switching paradigms developed for modern optical networks discussing their operation advantages disadvantages and implementation. Following a review of the evolution of optical WDM networks an overview of the future trends out. The latest developments in optical access local metropolitan and wide area networks are covered including detailed technical descriptions of generalized multiprotocol label switching waveband switching photonic slot routing optical flow burst and packet switching. The convergence of optical and wireless access networks is also discussed as are the IEEE 802.17 Resilient Packet Ring and IEEE 802.3ah Ethernet passive optical network standards and their WDM upgraded derivatives. The feasibility challenges and potential of next-generation optical networks are described in a survey of state-of-the-art optical networking testbeds. Animations showing how the key optical switching techniques work are available via the web as are lecture slides (www.cambridge.org/9780521868006).


ISBN: 9781107429307 244pp PB ₹ 995.00 86 b/w illus.
The flow of granular materials such as sand, snow, coal, and catalyst particles is common occurrence in natural and industrial settings. The mechanics of these materials is not well understood. They are important since a large fraction of the materials handled and processed in the chemical, metallurgical, pharmaceutical, and food processing industries are granular in nature. This book describes the theories for granular flow based mainly on continuum models although alternative discrete models are also discussed briefly. The level is appropriate for advanced undergraduates or beginning graduate students. The goal is to inform the reader about observed phenomena, some available models, and their shortcomings and to visit some issues that remain unresolved. There is a selection of problems at the end of the chapters to encourage exploration, and extensive references are provided.

ISBN: 9781316614198  PB  ₹ 1275.00

MRI reconstruction was reborn around 2007 when a branch of signal processing, Compressed Sensing (CS), began taking shape. This book summarises the most recent advances in the field after CS reached out to MR imaging. It discusses the application of CS in MR imaging and explains how MRI scans can now be done two to four times faster than earlier.

Contents: List of figures; List of tables; Foreword; Preface; Acknowledgements; Color Plates; 1. Mathematical Techniques; 2. Single Channel Static MR Image Reconstruction; 3. Multi-Coil Parallel MRI Reconstruction; 4. Dynamic MRI Reconstruction; 5. Applications in Other Areas; 6. Some Open Problems; Index; About the author

ISBN: 9781107103764  HB  ₹ 995.00
Continuous and Discrete Time Signals and Systems
Mrinal Mandal & Amir Asif

This textbook presents an introduction to the fundamental concepts of continuous-time (CT) and discrete-time (DT) signals and systems treating them separately in a pedagogical and self-contained manner. Emphasis is on the basic signal processing principles with underlying concepts illustrated using practical examples from signal processing multimedia communications and bioinformatics. Following introductory chapters the text is separated into two parts. Part I covers the theories techniques and applications of CT signals and systems and Part II discusses these topics for DT so that the two can be taught independently or together. Accompanying the book is a CD-ROM containing MATLAB code audio clips images interactive programs and signal animations. With over 300 illustrations 285 worked examples and 385 homework problems this textbook is an ideal introduction to the subject for undergraduates in electrical and computer engineering. Further resources including solutions for instructors are available online at www.cambridge.org/9780521854559

Contents:

ISBN: 9780521733137 PB ₹ 695.00

PB+CD-ROM

Electromechanics and MEMS
Thomas B. Jones

Offering a consistent, systematic approach to capacitive, piezoelectric and magnetic MEMS, from basic electromechanical transducers to high-level models for sensors and actuators, this comprehensive textbook equips graduate and senior-level undergraduate students with all the resources necessary to design and develop practical, system-level MEMS models. The concise yet thorough treatment of the underlying principles of electromechanical transduction provides a solid theoretical framework for this development, with each new topic related back to the core concepts. Repeated references to the shared commonalities of all MEMS encourage students to develop a systems-based design perspective. Extensive use is made of easy-to-interpret electrical and mechanical analogs, such as electrical circuits, electromechanical two-port models and the cascade paradigm. Each chapter features worked examples and numerous problems, all designed to test and extend students’ understanding of the key principles.

Contents:

ISBN: 9781316609040 580pp PB ₹ 695.00

Essentials of Mobile Handset Design
Abhi Naha & Peter Whale

Discover what is involved in designing the world’s most popular and advanced consumer product to date - the phone in your pocket. With this essential guide you will learn how the dynamics of the market and the pace of technology innovation constantly create new opportunities which design teams utilize to develop new products that delight and surprise us. Explore core technology building blocks such as chipsets and software components and see how these components are built together through the design lifecycle to create unique handset designs. Learn key design principles to reduce design time and cost and best practice guidelines to maximize opportunities to create a successful product. A range of real-world case studies are included to illustrate key insights. Finally emerging trends in the handset industry are identified and the global impact those trends could have on future devices is discussed.


Fundamentals of Digital Communication
Upamanyu Madhow

This is a concise presentation of the concepts underlying the design of digital communication systems without the detail that can overwhelm students. Many examples from the basic to the cutting-edge show how the theory is used in the design of modern systems and the relevance of this theory will motivate students. The theory is supported by practical algorithms so that the student can perform computations and simulations. Leading edge topics in coding and wireless communication make this an ideal text for students taking just one course on the subject. Fundamentals of Digital Communications has coverage of turbo and LDPC codes in sufficient detail and clarity to enable hands-on implementation and performance evaluation as well as ‘just enough’ information theory to enable computation of performance benchmarks to compare them against. Other unique features include space-time communication and geometric insights into noncoherent communication and equalization.


ISBN: 9780521171571 HB ₹ 845.00

Fundamentals of Signals and Systems
A Building Block Approach [International Student Edition]
Philip D. Cha

This innovative textbook provides a solid foundation in both signal processing and systems modeling using a building block approach. The authors show how to construct signals from fundamental building blocks (or basis functions), and demonstrate a range of powerful design and simulation techniques in Matlab, recognizing that signal data are usually received in discrete samples, regardless of whether the underlying system is discrete or continuous in nature. The book begins with key concepts such as the orthogonality principle and the discrete Fourier transform. Using the building block approach as a unifying principle, the modeling, analysis and design of electrical and mechanical systems are then covered, using various real-world examples. The design of finite impulse response filters is also described in detail. Containing many worked examples, homework exercises, and a range of Matlab laboratory exercises, this is an ideal textbook for undergraduate students of engineering, computer science, physics, and other disciplines.

ISBN: 9781107610446 PB ₹ 395.00
High-Frequency Integrated Circuits
Sorin Voinigescu


ISBN: 9781316607862 460pp PB ₹ 850.00

A transistor-level, design-intensive overview of high speed and high frequency monolithic integrated circuits for wireless and broadband systems from 2 GHz to 200 GHz, this comprehensive text covers high-speed, RF, mm-wave and optical fiber circuits using nanoscale CMOS, SiGe BiCMOS and III-V technologies. Step-by-step design methodologies, end-of-chapter problems and practical simulation and design projects are provided, making this an ideal resource for senior undergraduate and graduate courses in circuit design. With an emphasis on device-circuit topology interaction and optimization, it gives circuit designers and students alike an in-depth understanding of device structures and process limitations affecting circuit performance.


ISBN: 9781316607961 PB ₹ 1800.00

Introduction to Biomaterials
Basic Theory with Engineering Applications
C. Mauli Agrawal

Showcasing the essential principles behind modern communication systems, this accessible undergraduate textbook provides a solid introduction to the foundations of communication theory. Carefully selected topics introduce students to the most important and fundamental concepts, giving students a focused, in-depth understanding of core material, and preparing them for more advanced study. Abstract concepts are introduced to students 'just in time' and reinforced by nearly 200 end-of-chapter exercises, alongside numerous MATLAB code fragments, software problems and practical lab exercises, firmly linking the underlying theory to real-world problems, and providing additional hands-on experience. Finally, an accessible lecture-style organisation makes it easy for students to navigate to key passages, and quickly identify the most relevant material. Containing material suitable for a one- or two-semester course, and accompanied online by a password-protected solutions manual and supporting instructor resources, this is the perfect introductory textbook for undergraduate students studying electrical and computer engineering.

Contents: Part I. Introduction: 1.1 Analog or digital?; 1.2 A technology perspective; 1.3 The scope of this textbook; 1.4 Why study communication systems?; 1.5 Concept summary;
1.6 Notes; Part II. Signals and Systems: 2.1 Complex numbers; 2.2 Signals; 2.3 Linear time-invariant systems; 2.4 Fourier series; 2.5 The Fourier transform; 2.6 Energy spectral density and bandwidth; 2.7 Baseband and passband signals; 2.8 The structure of a passband signal; 2.9 Wireless-channel modeling in complex baseband; 2.10 Concept summary; 2.11 Notes; 2.12 Problems; Software labs; Part III. Analog Communication Techniques: 3.1 Terminology and notation; 3.2 Amplitude modulation; 3.3 Angle modulation; 3.3.1 Limiter-discriminator demodulation; 3.4 The superheterodyne receiver; 3.5 The phase-locked loop; 3.6 Some analog communication systems; 3.7 Concept summary; 3.8 Notes; 3.9 Problems; Software labs; Part IV. Digital Modulation: 4.1 Signal constellations; 4.2 Bandwidth occupancy; 4.3 Design for bandlimited channels; 4.4 Orthogonal and biorthogonal modulation; 4.5 Proofs of the Nyquist theorems; 4.6 Concept summary; 4.7 Notes; 4.8 Problems; Software lab; Appendices; Part V. Probability and Random Processes: 5.1 Probability basics; 5.2 Random variables; 5.3 Multiple random variables, or random vectors; 5.4 Functions of random variables; 5.5 Expectation; 5.6 Gaussian random variables; 5.7 Random processes; 5.8 Noise modeling; 5.9 Linear operations on random processes; 5.10 Concept summary; 5.11 Notes; 5.12 Problems; Appendices; Part VI. Optimal Demodulation: 6.1 Hypothesis testing; 6.2 Signal-space concepts; 6.3 Performance analysis of ML reception; 6.4 Bit error probability; 6.5 Link-budget analysis; 6.6 Concept summary; 6.7 Notes; 6.8 Problems; Software labs; Part VII. Channel Coding: 7.1 Motivation; 7.2 Model for channel coding; 7.3 Shannon’s promise; 7.4 Introducing linear codes; 7.5 Soft decisions and belief propagation; 7.6 Concept summary; 7.7 Notes; 7.8 Problems; Part VIII. Dispersive Channels and MIMO: 8.1 The single-carrier system model; 8.2 Linear equalization; 8.3 Orthogonal frequency-division multiplexing; 8.4 MIMO; 8.5 Concept summary; 8.6 Notes; 8.7 Problems; Software labs.

ISBN: 9781316608241 546pp PB ₹ 1000.00

Introduction to Computational Materials Science Fundamentals to Applications
Richard LeSar

Emphasising essential methods and universal principles, this textbook provides everything students need to understand the basics of simulating materials behaviour. All the key topics are covered from electronic structure methods to microstructural evolution, appendices provide crucial background material, and a wealth of practical resources are available online to complete the teaching package. Modelling is examined at a broad range of scales, from the atomic to the mesoscale, providing students with a solid foundation for future study and research. Detailed, accessible explanations of the fundamental equations underpinning materials modelling are presented, including a full chapter summarising essential mathematical background. Extensive appendices, including essential background on classical and quantum mechanics, electrostatics, statistical thermodynamics and linear elasticity, provide the background necessary to fully engage with the fundamentals of computational modelling. Exercises, worked examples, computer codes and discussions of practical implementations methods are all provided online giving students the hands-on experience they need.


ISBN: 9781316614877 428pp PB ₹ 995.00

Microwave and Wireless Measurement Techniques
Nuno Borges Carvalho

From typical metrology parameters for common wireless and microwave components to the implementation of measurement benches, this introduction to metrology contains all the key information on the subject. Using it, readers will be able to: Interpret and measure most of the parameters described in a microwave component's datasheet; Understand the practical limitations and theoretical principles of instrument operation; Combine several instruments into measurement benches for measuring microwave and wireless quantities. Several practical examples are included, demonstrating how to measure intermodulation distortion, error vector magnitude, S-parameters and large signal waveforms. Each chapter then ends with a set of exercises, allowing readers to test their understanding of the material covered and making the book equally suited for course use and for self-study.

ISBN: 9781316614877 428pp PB ₹ 995.00
If you’ve been searching for a way to get up to speed quickly on IEEE 802.11n without having to wade through the entire standard, then look no further. This comprehensive overview describes the underlying principles, implementation details, and key enhancing features of 802.11n. A detailed discussion of the key throughput, robustness, and reliability enhancing features (such as MIMO, 40 MHz channels, and packet aggregation) is given, in addition to a clear summary of the issues surrounding legacy interoperability and coexistence. Advanced topics such as beamforming and fast link adaption are also covered. With numerous MAC and physical layer examples and simulation results included to highlight the benefits of the new features, this is an ideal reference for designers of WLAN equipment, and network managers whose systems adopt the new standard. It is also a useful distillation of 802.11n technology for graduate students and researchers in the field of wireless communication.

Contents: Preface; Foreword; 1. Introduction; Part I. Physical layer: 2. Orthogonal frequency division multiplexing; 3. MIMO/SDM basics; 4. PHY interoperability with 11a/g legacy OFDM devices; 5. High throughput; 6. Robust performance; Part II. Media access control layer: 7. Media access control; 8. MAC throughput enhancements; 9. Advanced channel access techniques; 10. Interoperability and coexistence; 11. MAC frame formats; Part III. Transmit beamforming: 12. Transmit beamforming; Acronyms; Index

ISBN: 9781316614211 234pp PB ₹ 500.00

Vibration and noise are two interrelated terms in the field of mechanical engineering. Vibration is caused by unbalanced inertial forces and moments whereas noise is the result of such vibrations. Noisy machines have always been a matter of concern. Lesser vibration ensures manufacturing to closer tolerances, lesser wear and tear, and longer fatigue life. Hence, a quieter machine is more cost-effective in the long run. It is now well understood that a quieter machine is in every way a better machine.

This book deals with such industrial and automotive noise and vibration, their measurement and control. This textbook stresses on physical concepts and the application thereof to practical problems. The author’s four decades of experience in teaching, research and industrial consultancy is reflected in the choice of the solved examples and unsolved problems.

The book targets senior undergraduate students in mechanical engineering as well as designers of industrial machinery and layouts. It can readily be used for self-study by practicing designers and engineers.


ISBN: 9789384463397 296pp PB ₹ 995.00

This clear and concise advanced textbook is a comprehensive introduction to power electronics. It considers the topics of analogue electronics, electric motor control and adjustable speed electrical drives, both a.c. and d.c. In recent years, great changes have taken place in the types of semiconductor devices used as power switches in engineering applications. In this second edition of a popular text, a further completely new chapter has been added, dealing with the application of PWM techniques in induction motor speed control. The chapters dealing with electronic switching devices and with adjustable speed drives have been entirely rewritten, to ensure the text is completely up-to-date. With numerous worked examples, exercises, and the many diagrams, advanced undergraduates and postgraduates will find this a readable and immensely useful introduction to the subject of power electronics.


ISBN: 9780521758338 416pp PB ₹ 895.00
The Science and Practice of Welding, now in its tenth edition and published in two volumes, is an introduction to the theory and practice of welding processes and their applications. Volume I, Welding Science and Technology, explains the basics principles of physics, chemistry and metallurgy as applied to welding. The section electrical principles includes a simple description of the silicone diode and resistor, the production and use of square wave, and one-knob stepless control of welding current. There is a comprehensive section on non-destructive testing (NDR) and destructive testing of welds and crack tip opening displacement testing. The text has been brought completely up to date and now includes a new chapter devoted to the inverter power unit. Duplex stainless steel has been included in the list of material described.

Quantum Transport
Atom to Transistor
Supriyo Datta

This book presents the conceptual framework underlying the atomistic theory of matter, emphasizing those aspects that relate to current flow. This includes some of the most advanced concepts of non-equilibrium quantum statistical mechanics. No prior acquaintance with quantum mechanics is assumed. Chapter 1 provides a description of quantum transport in elementary terms accessible to a beginner. The book then works its way from hydrogen to nanostructures, with extensive coverage of current flow. The final chapter summarizes the equations for quantum transport with illustrative examples showing how conductors evolve from the atomic to the ohmic regime as they get larger. Many numerical examples are used to provide concrete illustrations and the corresponding Matlab codes can be downloaded from the web. Videostreamed lectures, keyed to specific sections of the book, are also available through the web. This book is primarily aimed at senior and graduate students.

Signals and Systems
Principles and Applications
Shaila Dinkar Apte

This textbook provides a solid foundation in system modelling, system analysis, and deterministic and random signals and systems, enabling students to develop an instinctive grasp of the fundamentals. The book begins with the basics of analog signals and introduces the concept of DT signals. It then covers the sampling processes in detail and discusses signals and operation on signals for both CT and DT signals. It includes Fourier transform and Laplace transform with adequate theory and numerical problems. With an emphasis on the advanced techniques used for signal processing, especially for speech and image processing, the properties of continuous time and discrete time signals are explained with many numerical problems. Real-life examples are provided to discuss the physical significance of different properties. Besides each concept is presented with MATLAB programs, output plots and simulation examples to help students execute simulations and verify their outputs. The book would interest students of electrical and communication engineering and computer science. This is an exceptional resource for anyone looking to develop their understanding of signals and systems.

Welding
CLPE
A. C. Davies

The Science and Practice of Welding, now in its tenth edition and published in two volumes, is an introduction to the theory and practice of welding processes and their applications. Volume I, Welding Science and Technology, explains the basics principles of physics, chemistry and metallurgy as applied to welding. The section electrical principles includes a simple description of the silicone diode and resistor, the production and use of square wave, and one-knob stepless control of welding current. There is a comprehensive section on non-destructive testing (NDR) and destructive testing of welds and crack tip opening displacement testing. The text has been brought completely up to date and now includes a new chapter devoted to the inverter power unit. Duplex stainless steel has been included in the list of material described.
This definitive textbook provides a solid introduction to discrete and continuous stochastic processes, tackling a complex field in a way that instills a deep understanding of the relevant mathematical principles, and develops an intuitive grasp of the way these principles can be applied to modelling real-world systems. It includes a careful review of elementary probability and detailed coverage of Poisson, Gaussian and Markov processes with richly varied queuing applications. The theory and applications of inference, hypothesis testing, estimation, random walks, large deviations, martingales and investments are developed. Written by one of the world's leading information theorists, evolving over twenty years of graduate classroom teaching and enriched by over 300 exercises, this is an exceptional resource for anyone looking to develop their understanding of stochastic processes.


ISBN: 9781316609033 556pp PB ₹ 1000.00

The point-source concept is a versatile technique that can be applied to a host of problems in civil, mechanical, chemical and aerospace engineering. Turbulent Jets: A Point-Source Method for Hydraulic Engineering is based on a momentum transport model applied to point-source. The method enunciated in the book helps to predict mean velocity, temperature and concentration field downstream of three-dimensional outlets, both in stagnant and co-flowing ambient fluid. The task of synthesizing the vast available literature, involving varied notations and normalization scales, has also been done to unify the underlying principles.

Contents: List of Figures; List of Tables; Preface; Chapter 1: Jets in Hydraulic Engineering; Chapter 2: Boundary Layer Approach; Chapter 3: Free Jets; Chapter 4: Reichardt’s Momentum Transport Theory; Chapter 5: Three-dimensional Free Jet; Single Outlet; Chapter 6: Coflowing Jets; Chapter 7: Multiple Free Jets; Chapter 8: Potential Core and Virtual Origin; Chapter 9: Energy Loss at Sewer Junction Boxes; Chapter 10: Jet Flocculator; Chapter 11: Wall Jets; Chapter 12: Comparison with CFD Analysis; References; Index

ISBN: 978175969285 392pp PB ₹ 850.00

Turbulent Jets
A Point-Source Method for Hydraulic Engineering
Pani Bidya Sagar

Unsteady Combustor Physics
Tim C. Lieuwen

Developing clean, sustainable energy systems is a pre-eminent issue of our time. Most projections indicate that combustion-based energy conversion systems will continue to be the predominant approach for the majority of our energy usage. Unsteady combustor issues present the key challenge associated with the development of clean, high-efficiency combustion systems such as those used for power generation, heating or propulsion applications. This comprehensive study is unique, treating the subject in a systematic manner. Although this book focuses on unsteady combusting flows, it places particular emphasis on the system dynamics that occur at the intersection of the combustion, fluid mechanics and acoustic disciplines. Individuals with a background in fluid mechanics and combustion will find this book to be an incomparable study that synthesises these fields into a coherent understanding of the intrinsically unsteady processes in combustors.
**Contents:**

ISBN: 9781316507964 426pp  PB  ₹ 1325.00

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**Vibration of Mechanical Systems**

Alok Sinha

This is a textbook for a first course in mechanical vibrations. There are many books in this area that try to include everything, thus they have become exhaustive compendiums, overwhelming for the undergraduate. In this book, all the basic concepts in mechanical vibrations are clearly identified and presented in a concise and simple manner with illustrative and practical examples. Vibration concepts include a review of selected topics in mechanics; a description of single-degree-of-freedom (SDOF) systems in terms of equivalent mass, equivalent stiffness, and equivalent damping; a unified treatment of various forced response problems (base excitation and rotating balance); an introduction to systems thinking, highlighting the fact that SDOF analysis is a building block for multi-degree-of-freedom (MDOF) and continuous system analyses via modal analysis; and a simple introduction to finite element analysis to connect continuous system and MDOF analyses.

There are more than sixty exercise problems, and a complete solutions manual. The use of MATLAB & reg; software is emphasized.

**Contents:**
- 1. Equivalent single degree of freedom system and free vibration; 2. Vibration of a single degree of freedom system under constant and purely harmonic excitation; 3. Responses of a SDOF spring-mass-damper system to periodic and arbitrary forces; 4. Vibration of two degrees of freedom systems; 5. Finite and infinite (continuous) dimensional systems; References; Appendix A; Appendix B; Appendix C.

ISBN: 9781316508909 324pp  PB  ₹ 695.00

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**Biomechanics Concepts and Computation**

Cees Oomens, Marcel Brekelmans & Frank Baaijens

This is the first textbook to integrate both general and specific topics theoretical background and biomedical engineering applications as well as analytical and numerical approaches. This quantitative approach integrates the classical concepts of mechanics and computational modelling techniques in a logical progression through a wide range of fundamental biomechanics principles. Online MATLAB-based software along with examples and problems using biomedical applications will motivate undergraduate biomedical engineering students to practice and test their skills. The book covers topics such as kinematics equilibrium stresses and strains and also focuses on large deformations and rotations and non-linear constitutive equations including visco-elastic behaviour and the behaviour of long slender fibre-like structures. This is the definitive textbook for students.

**Contents:**

ISBN: 9780521875585  HB  ₹ 2400.00

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**Fundamentals of Electrical Engineering**

S. B. L. Seksena and Kaustuv Dasgupta

This book offers a detailed treatment of fundamental concepts of electrical engineering. Written in simple language, this book provides a balance between theory and applications. Important topics including electromagnetic field theory, electrical circuits, network theorems, three-phase system and electrical machines are discussed in detail. Exhaustive pedagogical features including illustrations, solved problems, numerical exercises and multiple choice questions will help students in understanding and assessing the concepts of electrical engineering.

The book will be accompanied with rich teaching resources including solution manual for the instructors and an accompanying website. This will help the teachers to explain the concepts and to assess the strengths and shortcomings of the students. The website will offer additional study material and model question papers for the students. This textbook is intended for first year students of Engineering at undergraduate level.

The book presents the essential concepts of optical fiber communications in a manner which is student-friendly, interesting-to-read, and easy-to-understand. It covers all important topics in interactive manner, with emphasis on applications and user friendly features including summary, important equations, and facts-to-know features. The text emphasizes on several dispersion-management schemes that restore the amplified signal to its original state.

The theoretical concepts have been described from scratch, and well-supported by numerical problems and step-by-step solved examples. Adequate mathematical derivation and geometrical representation are included in the text. This text will be useful for the undergraduate and graduate students of electronics and communication engineering.

Solved Examples: 100; Numerical Questions: 219; Practice Questions: 177

Contents: 1. Introduction; 2. Basics of Optical Fibers; 3. Optical Sources and Transmitters; 4. Optical Receivers; 5. Optical Amplifiers; 6. Dispersion Management Techniques; 7. WDM Concepts and Components; 8. Optical Measurements; Appendix A: Fiber Optic Sensors; Appendix B: Radio over Fiber; Appendix C: Wireless Optics; Appendix D: Model Test Papers; Appendix E: Abbreviations and Acronyms

Environmental Studies – as a compulsory paper for undergraduate students of all disciplines – introduces the fundamental principles and concepts of environmental science, ecology and related interdisciplinary topics like policy, law, pollution control, economics and natural resource management. This textbook of Environmental Studies covers a wide range of concepts and issues including biodiversity, global warming, acid rain, ozone layer depletion, nuclear accidents, nuclear holocaust, disaster management, etc. Focusing on the immediate need for public awareness, it discusses the use and manipulation of various natural resources such as water, land, forests, food and mineral resources and the problems associated with natural resource management. It also analyses different types of ecosystems, biogeochemical cycles and the laws of thermodynamics with


This practically-oriented, all-inclusive guide covers all the major enabling techniques for current and next-generation cellular communications and wireless networking systems. Technologies covered include CDMA, OFDM, UWB, turbo and LDPC coding, smart antennas, wireless ad hoc and sensor networks, MIMO, and cognitive radios, providing readers with everything they need to master wireless systems design in a single volume. Uniquely, a detailed introduction to the properties, design, and selection of RF subsystems and antennas is provided, giving readers a clear overview of the whole wireless system. It is also the first textbook to include a complete introduction to speech coders and video coders used in wireless systems. Richly illustrated with over 400 figures, and with a unique emphasis on practical and state-of-the-art techniques in system design, rather than on the mathematical foundations, this book is ideal for graduate students and researchers in wireless communications, as well as for wireless and telecom engineers.


Environmental Studies – as a compulsory paper for undergraduate students of all disciplines – introduces the fundamental principles and concepts of environmental science, ecology and related interdisciplinary topics like policy, law, pollution control, economics and natural resource management. This textbook of Environmental Studies covers a wide range of concepts and issues including biodiversity, global warming, acid rain, ozone layer depletion, nuclear accidents, nuclear holocaust, disaster management, etc. Focusing on the immediate need for public awareness, it discusses the use and manipulation of various natural resources such as water, land, forests, food and mineral resources and the problems associated with natural resource management. It also analyses different types of ecosystems, biogeochemical cycles and the laws of thermodynamics with
Principles of Machine Design Volume 1
Ajeet Singh

This book consists of 23 chapters spread across 4 units. It provides an extensive coverage and comprehensive discussion on the fundamental concepts and processes of machine design. The book starts by giving a background to the subject and then discusses the types of materials, their properties and their selection criteria for designing. Unit 2 covers different types of stresses including direct stress, bending stress, torsional stress and combined stress in detail.

Unit 3 covers different types of temporary and permanent joints including pin joint, cotter joint, threaded joint, riveted joint and welded joint. The final unit covers the design procedure of keys, cotters, couplings, shafts, levers and springs in detail. It discusses applications of different types of joints used in boilers, bridges, power presses, automobile springs, crew jack and coupling. The chapters are rich in pedagogical features like solved examples, unsolved exercises, design problems and review questions.

This textbook is primarily meant for undergraduate students of mechanical engineering for a course on machine design 1. The book will be accompanied with teaching resources including solution manual for the instructors.

Contents:

ISBN: TBA 600pp PB ₹ 495/- (T)

Principles of Machine Design Volume 2
Ajeet Singh

This textbook consists of 20 chapters spread across 4 units. The first unit covers fundamental concepts, types and applications of belt drives, pulleys, rope drives, chain and socket drive, spur gears, helical gears and bevel gears in detail. Unit 2 discusses construction aspects, classification, material required, design procedures and selection parameters for hydrodynamic and rolling bearings. The design steps are discussed comprehensively, which helps students and teachers in practical classes.

Unit 3 discusses different types and construction processes of important parts of an internal combustion engine including cylinder, piston, connecting rod, crank shaft and valve gears. The final unit comprehensively discusses the design procedure, types and construction of flywheels, clutches, brakes and pressure vessels. Pedagogical features including solved examples, unsolved exercises, design problems and review questions are interspersed throughout the book.

This textbook is primarily meant for undergraduate students of mechanical engineering for a course on machine design 2. The book will be accompanied with teaching resources including solution manual for the instructors.

Contents:

ISBN: TBA 800pp PB ₹ 495/- (T)
undergraduate and graduate students of electronics and communication engineering.

Solved Examples: 100; Open Book Exam Questions: 60; Practice Questions: 200


ISBN: TBA 580pp PB ₹ 450.00

Basic Electronics
Principles and Applications
Chinmoy Saha, Arindam Halder

It offers a comprehensive discussion on the fundamental concepts of electronics engineering. The book is written in lucid language to provide a balance between theoretical concepts and their applications. Detailed discussion of several essential topics including semiconductors, amplifiers, oscillators and field effect transistors along with real life applications are included. This will help students in understanding the concepts in a better way.

The text includes two chapters on operational amplifiers and oscillators and multivibrators, discussing applications of OPAMP and oscillator circuits. The book includes extensive pedagogical features including solved problems, unsolved exercises and multiple choice questions to benefit students in learning and assessing the concepts of electronics engineering.


ISBN: 9781316632932 750pp PB ₹ 450.00

Stochastic Dynamics, Filtering and Optimization
Debasish Roy, G. Visweswara Rao

This book covers fundamentals of stochastic processes with applications to dynamical systems in science, engineering and recursive search algorithms. The book discusses fundamental concepts and theory of stochastic processes, calculus, Ito-Taylor expansion and numerical integration of stochastic differential equations (SDEs) in detail. Topics such as Radon-Nikodym derivatives and Girsanov theorems with emphasis on Ito diffusion processes are comprehensively discussed.

The text discusses advances in numerically integrating such as dynamical systems, nonlinear stochastic filtering and generalized Bayesian updating theories.

Contents: Preface; Acknowledgment; Chapter 1 Probability Theory and Random Variables; Chapter 2 Random Variables: Conditioning, Convergence and Simulation; Chapter 3 An Introduction to Stochastic Processes; Chapter 4 Stochastic Calculus and Diffusion Processes; Chapter 5 Numerical Solutions to Stochastic Differential Equations; Chapter 6 Nonlinear Stochastic Filtering and Recursive Monte Carlo Estimation; Chapter 7 Nonlinear Filters with Gain-type Additive Updates; Chapter 8 Improved Numerical Solutions to SDEs by Change of Measure; Chapter 9 Evolutionary Global Optimization via Change of Measures and Martingale Theory; Chapter 10 COMBEO: Global optimization by Change of Measures; References; Bibliography

ISBN: 9781107182646 750pp HB ₹ 895.00

Manufacturing Processes
Casting, Forming, and Welding
H S Shan

The text provides an extensive coverage on the fundamental principles and operational details of manufacturing processes like metal casting, forging and forming, and welding. The book starts by giving a background to the subject and then discusses important features of the manufacturing process with suitable line diagrams. It covers advanced topics such as evaporative pattern casting, isothermal forging, powder metallurgy, laser beam welding and friction stir welding processes in detail. One of the salient features of the book includes extensive use of line diagrams and photographs for visualization and elucidation of concepts. Pedagogical features such as solved examples, numerical problems, review questions and multiple choice questions are included in each chapter. This textbook is meant for undergraduate students of mechanical, industrial and production engineering for a course on manufacturing processes. The book will be accompanied with teaching resources including solution manual for the instructors.

Contents: Preface; Dedication; Chapter 1 Introduction to Manufacturing Processes; Chapter 2 Introduction to Metal Casting; Chapter 3 Expendable-Mold Casting Processes; Chapter 4 Permanent Mould Casting Processes; Chapter 5 Metal Melting, Pouring, and Shaping Processes; Chapter 6 Casting Cleaning and Inspection; Chapter 7 Casting Design Principles; Chapter 8 Metal Forming and Shaping Processes; Chapter 9 Metal Rolling Process; Chapter 10 Metal Forging Processes; Chapter 11 Metal Extrusion and Drawing; Chapter 12 Sheet Metal Forming and Shaping Processes; Chapter 13 High Energy Rate Metal Forming Processes; Chapter 14 Powder Metallurgy; Chapter 15 Introduction to Joining Processes; Chapter 16 Gas Welding Processes; Chapter 17 Electric Arc Welding and Cutting Processes; Chapter 18 Resistance Welding Processes; Chapter 19 Special Welding Processes; Chapter 20 Weld Inspection, Testing and Defect Analysis; Chapter 21 Plastics and Processing of Plastics; References; Appendix

ISBN: 500pp ₹ 350/- (T)
Liquid Crystal Dimers
Sandeep Kumar, Santanu K Pal

Liquid crystals are kind of soft materials that exhibit unique functionality of combining both order and mobility at a molecular, supramolecular and macroscopic level. Although a lot of research is going on in the area of liquid crystal dimers, there is no book available for the readers.

This book comprehensively covers the design principles, synthesis and thermal behavior of all types of LC dimers. Along with the fundamental concepts it discusses new advances in the field of liquid crystal dimers including various mesogenic units such as calamitic, discotic and bent-core molecules.

It begins with a chapter on the introduction of dimers, odd-even behavior, basic classification and most common mesophases in these dimers. The book focusses on the usage of liquid crystal dimers to develop new materials to study a range of interesting phenomena such as biaxial nematic phase containing rod-like and disc-like mesogenic unit.

Contents: Preface; 1. Introduction; 2. Calamitic-Calamitic Liquid Crystal Dimers; 3. Calamitic-Cholesteric Liquid Crystal Dimers; 4. Discotic Liquid Crystal Dimers; 5. Bent-core Liquid Crystal Dimers; 6. Perspectives; Bibliography; Index

ISBN: 9781107157590 350pp HB ₹ 995.00
Vectors and tensors are among the most powerful problem-solving tools available, with applications ranging from mechanics and electromagnetics to general relativity. Understanding the nature and application of vectors and tensors is critically important to students of physics and engineering. Adopting the same approach used in his highly popular A Student's Guide to Maxwell's Equations, Fleisch explains vectors and tensors in plain language. Written for undergraduate and beginning graduate students, the book provides a thorough grounding in vectors and vector calculus before transitioning through contra and covariant components to tensors and their applications. Matrices and their algebra are reviewed on the book's supporting website, which also features interactive solutions to every problem in the text where students can work through a series of hints or choose to see the entire solution at once. Audio podcasts give students the opportunity to hear important concepts in the book explained by the author.


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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.


ISBN: 9781107643529 846pp PB ₹ 695.00
106 b/w illus. 510 exercises
Student Solution Manual for Essential Mathematical Methods for the Physical Sciences
K. F. Riley & M. P. Hobson

This Student Solution Manual provides complete solutions to all the odd-numbered problems in Essential Mathematical Methods for the Physical Sciences. It takes students through each problem step-by-step, so they can clearly see how the solution is reached, and understand any mistakes in their own working. Students will learn by example how to select an appropriate method, improving their problem-solving skills.


ISBN: 9781107675421 250pp PB ₹ 495.00

Research Methods for Science
Michael P. Marder

A unique introduction to the design, analysis, and presentation of scientific projects, this is an essential textbook for undergraduate majors in science and mathematics. The textbook gives an overview of the main methods used in scientific research, including hypothesis testing, the measurement of functional relationships, and observational research. It describes important features of experimental design, such as the control of errors, instrument calibration, data analysis, laboratory safety, and the treatment of human subjects. Important concepts in statistics are discussed, focusing on standard error, the meaning of p values, and use of elementary statistical tests. The textbook introduces some of the main ideas in mathematical modeling, including order-of-magnitude analysis, function fitting, Fourier transforms, recursion relations, and difference approximations to differential equations. It also provides guidelines on accessing scientific literature, and preparing scientific papers and presentations. An extensive instructor's manual containing sample lessons and student papers is available at: www.cambridge.org/Marder.


ISBN: 9781107621992 236pp PB ₹ 395.00

A Student's Guide to Fourier Transforms
With Applications in Physics and Engineering
Third Edition
John James

Fourier transform theory is of central importance in a vast range of applications in physical science, engineering and applied mathematics. Providing a concise introduction to the theory and practice of Fourier transforms, this book is invaluable to students of physics, electrical and electronic engineering, and computer science. After a brief description of the basic ideas and theorems, the power of the technique is illustrated through applications in optics, spectroscopy, electronics and telecommunications. The rarely discussed but important field of multi-dimensional Fourier theory is covered, including a description of Computer Axial Tomography (CAT scanning). The book concludes by discussing digital methods, with particular attention to the Fast Fourier Transform and its implementation. This new edition has been revised to include new and interesting material, such as convolution with a sinusoid, coherence, the Michelson stellar interferometer and the van Cittert–Zernike theorem, Babinet's principle and dipole arrays.


ISBN: 9781107645509 160pp PB ₹ 345.00

Optical Physics
Fourth Edition
Ariel Lipson, Stephen G. Lipson & Henry Lipson

This fourth edition of a well-established textbook takes students from fundamental ideas to the most modern developments in optics. Illustrated with 400 figures, it contains numerous practical examples, many from student laboratory experiments and lecture demonstrations. Aimed at undergraduate and advanced courses on modern optics, it is ideal for scientists and engineers. The book covers the principles of geometrical and physical optics, leading into quantum optics, using mainly Fourier transforms and linear algebra. Chapters are supplemented with advanced topics and up-to-date applications, exposing readers to key research themes, including negative refractive index, surface plasmon resonance, phase retrieval in crystal diffraction and the Hubble telescope, photonic crystals, super-resolved imaging in biology, electromagnetically induced transparency, slow light and superluminal propagation, entangled photons and solar energy collectors. Solutions to the problems, simulation programs, key figures and further discussions of several topics are available at www.cambridge.org/lipson.

Introduction to Nonlinear Optics
Geoffrey New

Since the early days of nonlinear optics in the 1960s, the field has expanded dramatically, and is now a vast and vibrant field with countless technological applications. Providing a gentle introduction to the principles of the subject, this textbook is ideal for graduate students starting their research in this exciting area. After basic ideas have been outlined, the book offers a thorough analysis of second harmonic generation and related second-order processes, before moving on to third-order effects, the nonlinear optics of short optical pulses and coherent effects such as electromagnetically-induced transparency. A simplified treatment of high harmonic generation is presented at the end. More advanced topics, such as the linear and nonlinear optics of crystals, the tensor nature of the nonlinear coefficients and their quantum mechanical representation, are confined to specialist chapters so that readers can focus on basic principles before tackling these more difficult aspects of the subject.


ISBN: 9781107655003 590pp PB ₹ 675.00
375 b/w illus. 60 exercises

Electronic Transport in Mesoscopic Systems
Supriyo Datta

The advent of semiconductor structures whose characteristic dimensions are smaller than the mean free path of an electron has led to the development of novel devices, and advances in theoretical understanding of mesoscopic systems or nanostructures. This book has been thoroughly revised and provides a much-needed update on the very latest experimental research into mesoscopic devices and develops a detailed theoretical framework for understanding their behaviour. Beginning with the key observable phenomena in nanostructures, the authors describe quantum confined systems, transmission in nanostructures, quantum dots, and single electron phenomena. Separate chapters are devoted to interference in diffusive transport, temperature decay of fluctuations, and nonequilibrium transport and nanodevices. Throughout the book, the authors interweave experimental results with the appropriate theoretical formalism. The book will be of great interest to graduate students taking courses in mesoscopic physics or nanoelectronics, and researchers working on semiconductor nanostructures.


ISBN: 9781107605282 394pp PB ₹ 795.00
145 b/w illus. 2 tables
Principles of the Theory of Solids
Second Edition
J. M. Ziman

Professor Ziman's classic textbook on the theory of solids was first published in 1964. This paperback edition is a reprint of the second edition, which was substantially revised and enlarged in 1972. The value and popularity of this textbook is well attested by reviewers' opinions and by the existence of several foreign language editions, including German, Italian, Spanish, Japanese, Polish and Russian. The book gives a clear exposition of the elements of the physics of perfect crystalline solids. In discussing the principles, the author aims to give students an appreciation of the conditions which are necessary for the appearance of the various phenomena. A self-contained mathematical account is given of the simplest model that will demonstrate each principle. A grounding in quantum mechanics and knowledge of elementary facts about solids is assumed. This is therefore a textbook for advanced undergraduates and is also appropriate for graduate courses.

Contents:

ISBN: 9781107641341 452pp PB ₹ 595.00

A Student's Guide to Maxwell's Equations
Daniel Fleisch

Maxwell's Equations are four of the most influential equations in science: Gauss's law for electric fields, Gauss's law for magnetic fields, Faraday's law, and the Ampere-Maxwell law. In this guide for students, each equation is the subject of an entire chapter, with detailed, plain-language explanations of the physical meaning of each symbol in the equation, for both the integral and differential forms. The final chapter shows how Maxwell's Equations may be combined to produce the wave equation, the basis for the electromagnetic theory of light. This book is a wonderful resource for undergraduate and graduate courses in electromagnetism and electromagnetics. A website hosted by the author, and available through www.cambridge.org/9780521701471, contains interactive solutions to every problem in the text. Entire solutions can be viewed immediately, or a series of hints can be given to guide the student to the final answer. The website also contains audio podcasts which walk students through each chapter, pointing out important details and explaining key concepts.

Contents:
Preface; 1. Gauss's law for electric fields; 2. Gauss's law for magnetic fields; 3. Faraday's law; 4. The Ampere–Maxwell law; 5. From Maxwell's equations to the wave equation; Appendix; Further reading; Index.

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Gravitation
Foundations and Frontiers
T. Padmanabhan

The 'Foundation' section develops the formalism in six chapters, and uses it in the next four chapters to discuss four key applications - spherical spacetimes, black holes, gravitational waves and cosmology. The six chapters in the 'Frontier' section describe cosmological perturbation theory, quantum fields in curved spacetime, and the Hamiltonian structure of general relativity, among several other advanced topics, some of which are covered in-depth for the first time in a textbook. The modular structure of the book allows different sections to be combined to suit a variety of courses. Over 200 exercises are included to test and develop the reader's understanding. There are also over 30 projects, which help readers make the transition from the book to their own original research.

Contents:

ISBN: 9780521178761 778pp PB ₹ 895.00

Astrophysics for Physicists
Arnab Rai Choudhuri

Designed for teaching astrophysics to physics students at advanced undergraduate or beginning graduate level, this textbook also provides an overview of astrophysics for astrophysics graduate students, before they delve into more specialized volumes. Assuming background knowledge at the level of a physics major, the textbook develops astrophysics from the basics without requiring any previous study in astronomy or astrophysics. Physical concepts, mathematical derivations and observational data are combined in a balanced way to provide a unified treatment. Topics such as general relativity and plasma physics, which are not usually covered in physics courses but used extensively in astrophysics, are developed from first principles. While the emphasis is on developing the fundamentals thoroughly, recent important discoveries are highlighted at every stage.

Contents:
of tensors and general relativity; 13. Some applications of general relativity; 14. Relativistic cosmology; Appendixes; References; Index.

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Lukas Novotny & Bert Hecht

Nano-optics is the study of optical phenomena and techniques on the nanometer scale, that is, near or beyond the diffraction limit of light. It is an emerging field of study, motivated by the rapid advance of nanoscience and nanotechnology which require adequate tools and strategies for fabrication, manipulation and characterization at this scale. In Principles of Nano-Optics the authors provide a comprehensive overview of the theoretical and experimental concepts necessary to understand and work in nano-optics. With a very broad perspective, they cover optical phenomena relevant to the nanoscale across diverse areas ranging from quantum optics to biophysics, introducing and extensively describing all of the significant methods. This is the first textbook specifically on nano-optics. Written for graduate students who want to enter the field, it includes problem sets to reinforce and extend the discussion. It is also a valuable reference for researchers and course teachers.

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Modern experimental developments in condensed matter and ultracold atom physics present formidable challenges to theorists. This book provides a pedagogical introduction to quantum field theory in many-particle physics, emphasizing the applicability of the formalism to concrete problems. This second edition contains two new chapters developing path integral approaches to classical and quantum nonequilibrium phenomena. Other chapters cover a range of topics, from the introduction of many-body techniques and functional integration, to renormalization group methods, the theory of response functions, and topology. Conceptual aspects and formal methodology are emphasized, but the discussion focuses on practical experimental applications drawn largely from condensed matter physics and neighboring fields. Extended and challenging problems with fully worked solutions provide a bridge between formal manipulations and research-oriented thinking. Aimed at elevating graduate students to a level where they can engage in independent research, this book complements graduate level courses on many-particle theory.


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This book discusses the phenomenal diversity of cosmic and terrestrial plasmas found in the early universe, galactic and intergalactic media, stellar atmospheres and their interiors, interstellar spaces, solar system and in the earth's ionosphere, and their observability with the most recent telescopes such as the Chandra X-ray telescope and gamma ray telescopes. It deals with different ways of creating plasmas such as thermal, pressure and radiative ionization for laboratory as well as cosmic plasmas.

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- Existence and detection of waves in plasmas to specify their density, temperature and magnetization
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**Introduction to Nanoelectronics**
Science, Nanotechnology, Engineering, and Applications
Vladimir Mitin, Dr. Viacheslav A. Kochelap & Dr. Michael A. Stroscio

Increasing miniaturization of devices, components, and integrated systems requires developments in the capacity to measure, organize, and manipulate matter at the nanoscale. This textbook, first published in 2007, is a comprehensive, interdisciplinary account of the technology and science that underpin nanoelectronics, covering the underlying physics, nanostructures, nanomaterials, and nanodevices. Without assuming prior knowledge of quantum physics, this book provides a unifying framework for the basic ideas needed to understand the recent developments in the field. Numerous illustrations, homework problems and interactive Java applets help the student to appreciate the basic principles of nanotechnology, and to apply them to real problems. Written in a clear yet rigorous and interdisciplinary manner, this textbook is suitable for advanced undergraduate and graduate students in electrical and electronic engineering, nanoscience, materials, bioengineering, and chemical engineering.

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**Elementary Quantum Mechanics Expanded Edition**
Peter Fong

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Quantum Phase Transitions in Transverse Field Spin Models

From Statistical Physics to Quantum Information

Amit Dutta, Gabriel Aeppli, Bikas K. Chakrabarti, Uma Divakaran, Thomas F. Rosenbaum, Diptiman Sen

The transverse field Ising and XY models (the simplest quantum spin models) provide the organizing principle for the rich variety of interconnected subjects which are covered in this book. From a generic introduction to in-depth discussions of the subtleties of the transverse field Ising and related models, it includes the essentials of quantum dynamics and quantum information. A wide range of relevant topics has also been provided: quantum phase transitions, various measures of quantum information, the effects of disorder and frustration, quenching dynamics and the Kibble-Zurek scaling relation, the Kitaev model, topological phases of quantum systems, and bosonization. In addition, it also discusses the experimental studies of transverse field models (including the first experimental realization of quantum annealing) and the recent realization of the transverse field Ising model using tunable Josephson junctions. Further, it points to the obstacles still remaining to develop a successful quantum computer.

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- Discusses the experimental studies of transverse field models
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**Jenny Olive**

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Physics of Partially Ionized Plasmas

Vinod Krishan

Plasma is one of the four fundamental states of matter; the other three being solid, liquid and gas. It is formed by heating a gas, which ionizes its molecules or atoms. Astrophysicists believe that plasma consists of charged particles, namely positive ions and negative electrons. Various components like molecular clouds, diffuse interstellar gas, solar atmosphere, earth's ionosphere and laboratory plasmas including fusion plasmas constitute the partially ionized plasmas. This book discusses different aspects of partially ionized plasmas including multi-fluid description, equilibrium and types of waves. The discussion goes on to reinonization phase of the universe along with a brief description of high discharge plasmas, tokomak plasmas and laser plasmas. Besides various elastic and inelastic collisions amongst the three particle species are also presented in the book. The author also demonstrates the novelties of partially ionized plasmas using many examples, for instance, in a partially ionized plasma, the magnetic induction is subjected to the ambipolar diffusion and the Hall effect in addition to the usual resistive dissipation. There is an observation of kinematic dynamo in partially ionized plasmas.


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Ioan James

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Advanced Quantum Mechanics
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Yuli V. Nazarov

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The Quantum Theory of Fields
Steven Weinberg

The Quantum Theory of Fields first published in 1996 is a self-contained comprehensive introduction to quantum field theory from Nobel Laureate Steven Weinberg. Volume II gives an account of the methods of quantum field theory and how they have led to an understanding of the weak strong and electromagnetic interactions of the elementary particles. The presentation of modern mathematical methods is throughout interwoven with accounts of the problems of elementary particle physics and condensed matter physics to which they have been applied. Many topics are included that are not usually found in books on quantum field theory. The book is peppered with examples and insights from the author’s experience as a leader of elementary particle physics. Exercises are included at the end of each chapter.
In this third volume of The Quantum Theory of Fields available for the first time in paperback Nobel Laureate Steven Weinberg continues his masterly exposition of quantum field theory. This volume presents a self-contained up-to-date and comprehensive introduction to supersymmetry - a highly active area of theoretical physics. The text introduces and explains a broad range of topics including supersymmetric algebras, supersymmetric field theories, extended supersymmetry supergraphs, non-perturbative results, supersymmetry in higher dimensions and supergravity. A thorough review is given of the phenomenological implications of supersymmetry including theories of both gauge and gravitationally-mediated supersymmetry breaking. Also provided is an introduction to mathematical techniques based on holomorphy and duality that have proved so fruitful in recent developments. This book contains much material not found in other books on supersymmetry including previously unpublished results. Exercises are included.

Contents: Preface to Volume III; Notation; 24. Historical introduction; 25. Supersymmetry algebras; 26. Supersymmetric field theories; 27. Supersymmetric gauge theories; 28. Supersymmetric versions of the standard model; 29. Beyond perturbation theory; 30. Supergraphs; 31. Supergravity; 32. Supersymmetry in higher dimensions; Author index; Subject index.

ISBN: 9781107528130 PB ₹ 1395.00

Introduction to Classical Mechanics
With Problems and Solutions
David Morin

This textbook covers all the standard introductory topics in classical mechanics including Newton’s laws, oscillations, energy, momentum, angular momentum, planetary motion, and special relativity. It also explores more advanced topics such as normal modes, the Lagrangian method, gyroscopic motion, fictitious forces, 4-vectors, and general relativity. It contains more than 250 problems with detailed solutions so students can easily check their understanding of the topic. There are also over 350 unworked exercises which are ideal for homework assignments. Password protected solutions are available to instructors at www.cambridge.org/9780521876223. The vast number of problems alone makes it an ideal supplementary text for all levels of undergraduate physics courses in classical mechanics. Remarks are scattered throughout the text discussing issues that are often glossed over in other textbooks and it is thoroughly illustrated with more than 600 figures to help demonstrate key concepts.


ISBN: 9780521185028 HB ₹ 995.00
The new edition of this highly acclaimed textbook contains several major additions, including more than four hundred new exercises (with hints and answers). To match the mathematical preparation of current senior college and university entrants, the authors have included a preliminary chapter covering areas such as polynomial equations, trigonometric identities, coordinate geometry, partial fractions, binomial expansions, induction, and the proof of necessary and sufficient conditions. Elsewhere, matrix decompositions, nearly-singular matrices and non-square sets of linear equations are treated in detail. The presentation of probability has been reorganised and greatly extended, and includes all physically important distributions. New topics covered in a separate statistics chapter include estimator efficiency, distributions of samples, t- and F-tests for comparing means and variances, applications of the chi-squared distribution, and maximum likelihood and least-squares fitting. In other chapters the following topics have been added: linear recurrence relations, curvature, envelopes, curve-sketching, and more refined numerical methods.


ISBN: 9780521612968 1272pp PB ₹ 495.00

This book, first published in 1998, is the second in a two volume work and introduces integral and differential calculus, waves, matrices, and eigenvectors for undergraduates in physics and engineering. Together, the two volumes cover all the mathematics needed for an introductory course in the physical sciences. The approach taken is to learn through understanding real examples, showing mathematics as a tool for understanding physical systems and their behaviour. The aim is to make the student feel at home with real problems by creating a toolkit through a wide range of examples. The traditional approach of teaching theory for its own sake is not used in this course. Dr. Lyons brings a wealth of teaching experience to this refreshing textbook on the fundamentals of mathematics for physics and engineering.


ISBN: 9780521786157 400pp PB ₹ 495.00

Unique in its coverage of all aspects of modern particle physics, this textbook provides a clear connection between the theory and recent experimental results, including the discovery of the Higgs boson at CERN. It provides a comprehensive and self-contained description of the Standard Model of particle physics suitable for upper-level undergraduate students and graduate students studying experimental particle physics. Physical theory is introduced in a straightforward manner with full mathematical derivations throughout. Fully-worked examples enable students to link the mathematical theory to results from modern particle physics experiments. End-of-chapter exercises, graded by difficulty, provide students with a deeper understanding of the subject. Online resources available at www.cambridge.org/MPP feature password-protected fully-worked solutions to problems for instructors, numerical solutions and hints to the problems for students and PowerPoint slides and JPEGs of figures from the book.


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Fourth Edition
Gordon L. Squires

Practical Physics demonstrates the purposive and critical approach that should be made to all experimental work in physics. It does not describe a systematic course of experiments, but is intended as a companion to any undergraduate course of practical work. The text is in three parts. The first deals with the statistical treatment of data, the second with experimental methods, and the third with such essential matters as keeping efficient records, accuracy in calculations, and scientific writing. The text is liberally illustrated with examples and exercises, with solutions to the latter. The new edition includes a treatment of the C2 distribution, a section on atomic clocks, worked examples based on spreadsheets, and additional exercises. Existing examples and references have been brought up to date. Although intended for undergraduates, Practical Physics has proved of interest to school-students, teachers, and researchers, not only in physics, but also in other branches of science.


ISBN: 9781107512795 228pp PB ₹ 350.00

Testing Quantum Mechanics on New Ground
Partha Ghose

Technological advances have made it possible to perform experiments once considered to be purely gedanken which test the counterintuitive and bizarre consequences of quantum theory. This book provides simple accounts of these experiments and an understanding of what they aim to prove and why this is important. After introducing the main theoretical concepts and problems with the foundations of quantum mechanics early chapters discuss experiments in the areas of wave-particle duality cavity quantum electrodynamics and quantum non-demolition measurement. The text then examines investigation of certain predictions including the Aharonov-Bohm effect before tackling the problem of macroscopic quantum coherence. Later chapters consider methods of testing the quantum Zeno paradox collapse macroscopic quantum jumps tunnelling times and Einstein-Bell non-locality. Introductions to the theory behind types of measuring devices such as micromasers and those based on the concept of quantum non-demolition are also given. Detailed references are included.


ISBN: 9780521554633 HB ₹ 1380.00

The Large The Small and The Human Mind
Penrose

Roger Penrose’s original and provocative ideas about the large-scale physics of the Universe the small-scale world of quantum physics and the physics of the mind have been the subject of controversy and discussion. These ideas were set forth in his best-selling books The Emperor’s New Mind and Shadows of the Mind. In this book he summarises and brings up to date his current thinking in these complex areas. He presents a masterful summary of those areas of physics in which he feels there are major unsolved problems. Through this he introduces radically new concepts which he believes will be fruitful in understanding the workings of the brain and the nature of the human mind. These ideas are then challenged by three distinguished experts from different backgrounds-Abner Shimony and Nancy Cartwright as philosophers of science and Stephen Hawking as a theoretical physicist and cosmologist. Finally Roger Penrose responds to their thought-provoking criticisms. This volume provides an accessible illuminating and stimulating introduction to Roger Penrose’s vision of theoretical physics for the 21st century. His enthusiasm insight and good humour shine through this brilliant account of the problems of modern physics.

Contents: Foreword Malcolm Longair; 1. Spacetime and cosmology Roger Penrose; 2. The mysteries of quantum physics Roger Penrose;
Time Space and Things
B. K. Ridley

There are some wonderfully bizarre ideas in physics and it seems a pity to keep them locked up in small boxes available only to an esoteric coterie of key holders. Brian Ridley's book sets out to survey in simple non-mathematical terms what physics has to say about the fundamental structure of the universe. He deals with all the basic concepts of modern physics: elementary particles black holes gravity quantum theory time mass relativity and energy; this new edition also includes coverage of more recently emerging ideas including strings imaginary time and chaos. Ridley's clear and witty account gives an exciting introduction to the non-specialist while offering a fresh perspective to scientists themselves.


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SPACE the Final Frontier?
Giancarlo Genta, Michael Rycroft

What are our motivations for going into space? Where does our long-term space future lie? Why, and how, should we strive to reach, if not for the stars, at least for the Moon and Mars? This exciting book looks first at the progress that has already been made in our attempts to explore and expand beyond the Earth. Current and past space technologies and space stations are described, and the effects of the space environment on the human body are explained. A discussion of the merits of the robotic exploration of space is followed by a look at our exploration of the Moon and Mars. Final chapters touch on propulsion methods required for leaving our solar system, and ask which of the possibilities for future space travel is most likely to succeed. This thought provoking book will appeal to all those with an interest in the future of space exploration.


ISBN: 9780521814034 HB ₹ 995.00

Limit Order Books
Frederic Abergel, Anirban Chakraborti, Aymen Jedidi, Ioane Muni Toke and Marouane Anane

The book discusses several models of limit order books and introduces general, flexible, open source library, useful to readers in studying trading strategies in an open-driven market. It begins by discussing the data to assess their empirical properties, and then move on to mathematical models in order to reproduce the observed properties and finally presents a framework for numerical simulations. It covers some of the important modelling techniques including agent-based modelling, advanced modelling of limit order books based on Hawkes processes, Jaisson and Rosenbaum theories and LLOB models in detail. The book gives an in-depth coverage of simulation techniques such as numerical simulation and limit order book simulator.

The book will be useful to the graduate students in the field of financial mathematics, actuarial mathematics and high frequency financial data. The contents of this book are taught by the authors at Ecole Centrale Paris (France) for a course on “Physics of Markets”. Also a course based on the content of this book has been taught at the Graduate School of Mathematical Sciences, the University of Tokyo (Japan), and will be taught at the ScuolaNormaleSuperiore di Pisa (Italy) for a course in financial and actuarial mathematics.


ISBN: 9781107163980 250pp HB ₹ 895.00

Brownian Motion
Peter Morters & Yuval Peres

This eagerly awaited textbook covers everything the graduate student in probability wants to know about Brownian motion as well as the latest research in the area. Starting with the construction of Brownian motion the book then proceeds to sample path properties like continuity and nowhere differentiability. Notions of fractal dimension are introduced early and are used throughout the book to describe fine properties of Brownian paths. The relation of Brownian motion and random walk is explored from several viewpoints including a development of the theory of Brownian local times from random walk embeddings. Stochastic integration is introduced as a tool and an accessible treatment of the potential theory of Brownian motion clears the path for an extensive treatment of intersections of Brownian paths. An investigation of exceptional points on the Brownian path and an appendix on SLE processes by Oded Schramm and Wendelin Werner lead directly to recent research themes.

Contents: Preface; Frequently used notation; Motivation; 1. Brownian motion as a random function; 2. Brownian motion as a strong Markov process; 3. Harmonic functions transience and recurrence; 4. Hausdorff dimension: techniques

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Physics, encompassing both the microscopic and macroscopic theories.


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Non-Relativistic Quantum Mechanics

Ravinder R. Puri

The book introduces the reader to non-relativistic quantum mechanics and its mathematical methods. It begins by recounting the main historical developments leading to the present formulation of the quantum postulates. Starting with postulates, a wide range of fundamental topics and topics of current research interests like quantum information, nano structures, non-cloning theorem, quantum Zeno effect and POVM are discussed in detail.

Relevant topics in mathematics like linear algebra and second order ordinary linear differential equations are discussed at length.

The theory of second order ordinary linear differential equations is presented by classifying them according to their singularity structure. The book discusses a unified treatment of time-independent exactly solvable continuous onedimensional potentials. A number of exercises are given in each chapter with hints wherever necessary.

Contents: Preface; Acknowledgment; Chapter 1- History of Quantum Mechanics; Chapter 2- Vectors and Operators; Chapter 3- Finite Dimensional Spaces; Chapter 4- Function Space; Chapter 5- Postulates of Quantum Mechanics; Chapter 6- Density Operator; Chapter 7- Measurement Postulate and Paradoxes of Quantum Mechanics; Chapter 8- Position and Momentum Representations; Chapter 9- Schrodinger Equation in One Dimension: Qualitative Properties of its Solution; Chapter 10- One Dimensional Piecewise Constant Potentials; Chapter 11- One Dimensional Exactly Solvable Continuous Potentials; Chapter 12- Partially and Completely Periodic Potentials; Chapter 13- Harmonic Oscillator; Chapter 14- Supersymmetric Quantum Mechanics; Chapter 15- Three-Dimensional Central Potential; Chapter 16- Approximation Methods; Chapter 17- Symmetry in Quantum Mechanics; Chapter 18- Quantum Theory of Angular Momentum; Chapter 19- Entanglement and Local Hidden Variable Theory; Appendices; References

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This book contains an introduction to hyperbolic partial differential equations and a powerful class of numerical methods for approximating their solution, including both linear problems and nonlinear conservation laws. These equations describe a wide range of wave-propagation and transport phenomena arising in nearly every scientific and engineering discipline. Several applications are described in a self-contained manner, along with much of the mathematical theory of hyperbolic problems. High-resolution versions of Godunov's method are developed, in which Riemann problems are solved to determine the local wave structure and limiters are then applied to eliminate numerical oscillations. These methods were originally designed to capture shock waves accurately, but are also useful tools for studying linear wave-propagation problems, particularly in heterogeneous material. The methods studied are implemented in the CLAWPACK software package. Source code for all the examples presented can be found on the web, along with animations of many time-dependent solutions. This provides an excellent learning environment for understanding wave-propagation phenomena and finite-volume methods.


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135 b/w illus. 108 exercises
This is a matrix-oriented approach to linear algebra that covers the traditional material of the courses generally known as “Linear Algebra I” and “Linear Algebra II” throughout North America, but it also includes more advanced topics such as the pseudoinverse and the singular value decomposition that make it appropriate for a more advanced course as well. As is becoming increasingly the norm, the book begins with the geometry of Euclidean 3-space so that important concepts like linear combination, linear independence and span can be introduced early and in a “real” context. The book reflects the author’s background as a pure mathematician – all the major definitions and theorems of basic linear algebra are covered rigorously – but the restriction of vector spaces to matrices, for the most part, and the continual emphasis on the system $Ax=b$, make the book less abstract and more attractive to the students of today than some others. As the subtitle suggests, however, applications play an important role too. Coding theory and least squares are recurring themes. Other applications include electric circuits, Markov chains, quadratic forms and conic sections, facial recognition and computer graphics.

Contents: Preface: To My students; Suggested lecture schedule; 1. Euclidean $n$-space; 2. Matrices and linear equations; 3. Determinants, eigenvalues, eigenvectors; 4. Vector spaces; 5. Linear transformations; 6. Orthogonality; 7. The spectral theorem • Appendix A: Complex numbers; • Appendix B: Show and Prove • Appendix C: Things I must remember • Answers to True/False and BB Exercises; Glossary; Index

ISBN: 9789384463342    732pp PB    ₹ 795.00

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Basic Commutative Algebra
Balwant Singh
(World Scientific)

This textbook, set for a one or two semester course in commutative algebra, provides an introduction to commutative algebra at the postgraduate and research levels. The main prerequisites are familiarity with groups, rings and fields. Proofs are self-contained.

The book will be useful to beginners and experienced researchers alike. The material is so arranged that the beginner can learn through self-study or by attending a course. For the experienced researcher, the book may serve to present new perspectives on some well-known results, or as a reference.

Contents: • Rings and Ideals; • Modules and Algebras; • Polynomial and Power Series Rings; • Homological Tools I; • Tensor, Symmetric and Exterior Algebras; • Finiteness Conditions; • Primary Decomposition; • Filtrations and Completions; • Numerical Functions; • Principal Ideal Theorem; • Integral Extensions; • Normal Domains; • Transcendental Extensions; • Affine Algebras; • Derivations and Differentials; • Valuation Rings and Valuations; • Homological Dimensions; • Depth; • Regular Rings; • Divisor Class Groups

ISBN: 9789382993131 404pp PB ₹ 695.00

Numerical Solution of Elliptic and Parabolic Partial Differential Equations
John A. Trangenstein

For mathematicians and engineers interested in applying numerical methods to physical problems this book is ideal. Numerical ideas are connected to accompanying software, which is also available online. By seeing the complete description of the methods in both theory and implementation, students will more easily gain the knowledge needed to write their own application programs or develop new theory. The book contains careful development of the mathematical tools needed for analysis of the numerical methods, including elliptic regularity theory and approximation theory. Variational crimes, due to quadrature, coordinate mappings, domain approximation and boundary conditions, are analyzed. The claims are stated with full statement of the assumptions and conclusions, and use subscripted constants which can be traced back to the origination (particularly in the electronic version, which can be found on the accompanying CD-ROM).


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Geometry
Second Edition
David A. Brannan, Matthew F. Esplen & Jeremy J. Gray

This richly illustrated and clearly written undergraduate textbook captures the excitement and beauty of geometry. The approach is that of Klein in his Erlangen programme: a geometry is a space together with a set of transformations of the space. The authors explore various geometries: affine, projective, inversive, hyperbolic and elliptic. In each case they carefully explain the key results and discuss the relationships between the geometries. New features in this second edition include concise end-of-chapter summaries to aid student revision, a list of further reading and a list of special symbols. The authors have also revised many of the end-of-chapter exercises to make them more challenging and to include some interesting new results. Full solutions to the 200 problems are included in the text, while complete solutions to all of the end-of-chapter exercises are available in a new Instructors’ Manual, which can be downloaded from www.cambridge.org/ 9781107647831.


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Complex Variables
Principles and Problem Sessions
A. K. Kapoor
(World Scientific)

This textbook introduces the theory of complex variables at undergraduate level. A good collection of problems is provided in the second part of the book. The book is written in a user-friendly style that presents important fundamentals a beginner needs to master the technical details of the subject. The organization of problems into focused sets is an important feature of the book and the teachers may adopt this book for a course on complex variables and for mining problems.

Contents: Complex Numbers; Elementary Functions and Differentiation; Functions with Branch Point Singularity; Integration in the Complex Plane; Cauchy's Integral Formula; Residue Theorem; Contour Integration; Asymptotic Expansion; Conformal Mappings; Physical Applications of Conformal Mappings

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The link between the physical world and its visualization is geometry. This easy-to-read, generously illustrated textbook presents an elementary introduction to differential geometry with emphasis on geometric results. Avoiding formalism as much as possible, the author harnesses basic mathematical skills in analysis and linear algebra to solve interesting geometric problems, which prepare students for more advanced study in mathematics and other scientific fields such as physics and the wide range of topics includes curve theory, a detailed study of surfaces, curvature, variation of area and minimal surfaces, geodesics, spherical and hyperbolic geometry, the divergence theorem, triangulations, and the Gauss–Bonnet theorem. The section on cartography demonstrates the concrete importance of elementary differential geometry in applications. Clearly developed arguments and proofs, colour illustrations, and over 100 exercises and solutions make this book ideal for courses and self-study. The only prerequisites are one year of undergraduate calculus and linear algebra.

Contents: Preface; Notation; 1. Euclidean geometry; 2. Curve theory; 3. Classical surface theory; 4. The inner geometry of surfaces; 5. Geometry and analysis; 6. Geometry and topology; 7. Hints for solutions to (most) exercises; Formulary; List of symbols; References; Index.

ISBN: 9781107603967 330pp PB ₹ 595.00

147 b/w illus. 4 colour illus. 125 exercises

This book explains how computer software is designed to perform the tasks required for sophisticated statistical analysis. For statisticians, it examines the nitty-gritty computational problems behind statistical methods. For mathematicians and computer scientists, it looks at the application of mathematical tools to statistical problems. The first half of the book offers a basic background in numerical analysis that emphasizes issues important to statisticians. The next several chapters cover a broad array of statistical tools, such as maximum likelihood and nonlinear regression. The author also treats the application of numerical tools; numerical integration and random number generation are explained in a unified manner reflecting complementary views of Monte Carlo methods. Each chapter contains exercises that range from simple questions to research problems. Most of the examples are accompanied by demonstration and source code available from the author’s website. New in this second edition are demonstrations coded in R, as well as new sections on linear programming and the Nelder-Mead search algorithm.


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First Course in Metric Spaces provides a foundation for modern pure mathematics. The book is completely rigorous in its approach and covers all the standard topics. It provides ample solved examples and theorems to assist the students in self-study. The book contains many exercises to test understanding of the concepts learnt. The book is expected to meet the requirement of the undergraduate and graduate students, teachers and researchers in terms of sufficiently advanced material covered in the book.


ISBN: 9788175967281 364pp PB ₹ 495.00

Explanation of the basic concepts and methods of statistics requires a reasonably good mathematical background, at least at a first-year-level knowledge of calculus. Most of the statistical software explain how to conduct data analysis, but do not explain when to apply and when not to apply it. Keeping this in view, we try to explain the basic concepts of probability and statistics for students with an understanding of a first course in calculus at the undergraduate level. Designed as a textbook for undergraduate and first-year graduate students in statistics, biostatistics, social sciences and business administration programs as well as undergraduates in engineering sciences and computer science programs, it provides a clear exposition of the theory of probability along with applications in statistics. The book contains a large number of solved examples and chapter-end exercises designed to reinforce the probability theory and emphasize statistical applications.

Contents: Why Statistics?; Probability on Discrete Sample Spaces; Discrete Probability Distributions; Continuous Probability
This informal introduction provides a fresh perspective on isomorphism theory, which is the branch of ergodic theory that explores the conditions under which two measure preserving systems are essentially equivalent. It contains a primer in basic measure theory, proofs of fundamental ergodic theorems, and material on entropy, martingales, Bernoulli processes, and various varieties of mixing. Original proofs of classic theorems – including the Shannon–McMillan–Breiman theorem, the Krieger finite generator theorem, and the Ornstein isomorphism theorem - are presented by degrees, together with helpful hints that encourage the reader to develop the proofs on their own. Hundreds of exercises and open problems are also included, making this an ideal text for graduate courses.


ISBN: 9780521170314 182pp PB ₹ 595.00

305 exercises

This book discusses the representation theory of symmetric groups, the theory of symmetric functions and the polynomial representation theory of general linear groups. The first chapter provides a detailed account of necessary representation-theoretic background. An important highlight of this book is an innovative treatment of the Robinson–Schwensted–Knuth correspondence and its dual by extendingViennot's geometric ideas. Another unique feature is an exposition of the relationship between these correspondences, the representation theory of symmetric groups and alternating groups and the theory of symmetric functions. Schur algebras are introduced very naturally as algebras of distributions on general linear groups. The treatment of Schur–Weyl duality reveals the directness and simplicity of Schur's original treatment of the subject. This book is suitable for graduate students, advanced undergraduates and non-specialists with a background in mathematics or physics.

Contents: List of tables; Preface; 1. Basic concepts of representation theory; 2. Permutation representations; 3. The rsk correspondence; 4. Character twists; 5 Symmetric functions; 6. Representations of general linear groups; hints and solutions to selected exercises; Suggestions for further reading; References; Index

ISBN: 9780521169882 260pp PB ₹ 695.00

This text for a course in Real Analysis addresses advanced undergraduates and beginning graduate students in mathematics and related fields. Presupposing only a modest background in real analysis or advanced calculus, the book offers something of value to specialists and non-specialists alike. It considers three major topics: Metric and normed linear spaces, function spaces, and Lebesgue measure and integration on the line.

Written in an informal, down-to-earth style, the book motivates the reader with an intuitive overview of new ideas, while still supplying full details and complete proofs. The author includes historical commentary with references to original works and alternate presentations, recommends expository and survey articles for non-specialists and technical articles for specialists, and provides a great many exercises and suggestions for further study.

The author has written this text with the consideration of the heterogeneous audiences found at the masters level: students interested in pure and applied mathematics, statistics, education, engineering and economics.

This new edition of Introduction to Lattices and Order presents a radical reorganization and updating, though its primary aim is unchanged. The explosive development of theoretical computer science in recent years has, in particular, influenced the book's evolution: a fresh treatment of fixpoints testifies to this and Galois connections now feature prominently. An early presentation of concept analysis gives both a concrete foundation for the subsequent theory of complete lattices and a glimpse of a methodology for data analysis that is of commercial value in social science. Classroom experience has led to numerous pedagogical improvements and many new exercises have been added. As before, exposure to elementary abstract algebra and the notation of set theory are the only prerequisites, making the book suitable for advanced undergraduates and beginning graduate students. It will also be a valuable resource for anyone who meets ordered structures.


ISBN: 9780521696241 416pp PB ₹ 595.00
45 b/w illus

Gregory's Classical Mechanics is a major new textbook for undergraduates in mathematics and physics. It is a thorough, self-contained and highly readable account of a subject many students find difficult. The author's clear and systematic style promotes a good understanding of the subject: each concept is motivated and illustrated by worked examples, while problem sets provide plenty of practice for understanding and technique. Computer assisted problems, some suitable for projects, are also included. The book is structured to make learning the subject easy; there is a natural progression from core topics to more advanced ones and hard topics are treated with particular care. A theme of the book is the importance of conservation principles. These appear first in vectorial mechanics where they are proved and applied to problem solving. They reappear in analytical mechanics, where they are shown to be related to symmetries of the Lagrangian, culminating in Noether's theorem.


ISBN: 9780521733120 608pp PB ₹ 545.00
193 b/w illus. 3 tables 348 exercises

This introductory textbook is suitable for use in a first-year graduate course or for self-study, featuring broad coverage of the subject and a readable exposition, with many examples and exercises. Along with the basic material on fundamental group and covering spaces, homology and cohomology, higher homotopy groups, and homotopy theory, the book includes many optional topics for which elementary expositions are hard to find.


ISBN: 9780521713312 545.00
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ISBN: 9780521541862 500pp PB ₹ 695.00

All the Mathematics You Missed
But Need to Know for Graduate School
Thomas A. Garrity

This book will help students to see the broad outline of mathematics and to fill in the gaps in their knowledge. The author explains the basic points and a few key results of all the most important undergraduate topics in mathematics, emphasizing the intuitions behind the subject. The topics include linear algebra, vector calculus, differential geometry, real analysis, point-set topology, probability, complex analysis, abstract algebra, and more. An annotated bibliography then offers a guide to further reading and to more rigorous foundations. This book will be an essential resource for advanced undergraduate and beginning graduate students in mathematics, the physical sciences, engineering, computer science, statistics, and economics who need to quickly learn some serious mathematics.


ISBN: 9780521670340 372pp PB ₹ 495.00

Basic Abstract Algebra
Second Edition
P. B. Bhattacharya,
S. K. Jain &
S. R. Nagpaul

This book provides a complete abstract algebra course, enabling instructors to select the topics for use in individual classes. Complete proofs are given throughout for all theorems. This revised edition includes an introduction to lattices, a new chapter on tensor products and a discussion of the new (1993) approach to the Lasker-Noether theorem.


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Complex variables provide powerful methods for attacking many difficult problems, and it is the aim of this book to provide a thorough grounding in these methods and their application. This new edition has been improved throughout and is ideal for use in undergraduate and introductory graduate courses in complex variables.


An Introduction to Chaotic Systems

Finding and interpreting the solutions of differential equations is a central and essential part of applied mathematics. This book aims to enable the reader to develop the required skills needed for a thorough understanding of the subject. The authors focus on the business of constructing solutions analytically, and interpreting their meaning, using rigorous analysis where needed. MATLAB is used extensively to illustrate the material. There are many worked examples based on interesting and unusual real world problems. A large selection of exercises is provided, including several lengthier projects, some of which involve the use of MATLAB. The coverage is broad, ranging from basic second-order ODEs and PDEs, through to techniques for nonlinear differential equations, chaos, asymptotics and control theory.


Mathematics for Economics and Finance

An introduction to mathematical modelling in economics and finance for students of both economics and mathematics. Throughout, the stress is firmly on how mathematics relates to economics, illustrated with copious examples and exercises that will foster depth of understanding.

Foundation Mathematics
For the Physical Sciences
K. F. Riley & M. P. Hobson

This tutorial-style textbook develops the basic mathematical tools needed by first and second year undergraduates to solve problems in the physical sciences. Students gain hands-on experience through hundreds of worked examples, self-test questions and homework problems. Each chapter includes a summary of the main results, definitions and formulae. Over 270 worked examples show how to put the tools into practice. Around 170 self-test questions in the footnotes and 300 end-of-section exercises give students an instant check of their understanding. More than 450 end-of-chapter problems allow students to put what they have just learned into practice. Hints and outline answers to the odd-numbered problems are given at the end of each chapter. Complete solutions to these problems can be found in the accompanying Student Solutions Manual. Fully-worked solutions to all problems, password-protected for instructors, are available at www.cambridge.org/foundation

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2. Preliminary algebra;
3. Differential calculus;
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5. Complex numbers and hyperbolic functions;
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Elements of Numerical Analysis
Radhey S. Gupta

Numerical Analysis deals with manipulation of numbers to solve a particular problem. This book discusses in detail the creation, analysis and implementation of algorithms to solve the problems of continuous mathematics. An input is provided in form of numerical data or it is generated as required by the system to solve a mathematical problem. Subsequently this input is processed through arithmetic operations together with logical operations in a systematic manner and output is produced in the form of numbers. Covering the fundamentals of numerical analysis and its applications in one volume, this book offers detailed discussion on relevant topics including difference equations, Fourier series, discrete Fourier transforms and finite element methods. In addition, the important concepts of integral equations, Chebyshev Approximation and Eigen Values of Symmetric Matrices are elaborated in separate chapters. It serves as a textbook for the undergraduate students in science and engineering across all major universities in India.

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In Fortran
William H. Press

The book retains the informal easy-to-read style that made the first edition so popular with many new topics presented at the same accessible level. In addition some sections of more advanced material have been introduced set off in small type from the main body of the text. Numerical Recipes is an ideal textbook for scientists and engineers and an indispensable reference for anyone who works in scientific computing. Highlights of the new material include: A new chapter on integral equations and inverse methods Multigrid methods for solving partial differential equations Improved random number routines Wavelet transforms The statistical bootstrap method A new chapter on

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Incorporated in this volume are the first two books in Mukai's series on moduli theory. The notion of a moduli space is central to geometry. However its influence is not confined there; for example the theory of moduli spaces is a crucial ingredient in the proof of Fermat’s last theorem. Researchers and graduate students working in areas ranging from Donaldson or Seiberg-Witten invariants to more concrete problems such as vector bundles on curves will find this to be a valuable resource. Amongst other things this volume includes an improved presentation of the classical foundations of invariant theory that in addition to geometers would be useful to those studying representation theory. This translation gives an accurate account of Mukai’s influential Japanese texts.


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Les Pook

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Philippe Gille & Tamas Szamuely

This book is the first comprehensive modern introduction to the theory of central simple algebras over arbitrary fields. Starting from the basics it reaches such advanced results as the Merkurjev-Suslin theorem. This theorem is both the culmination of work initiated by Brauer Noether Hasse and Albert and the starting point of current research in motivic cohomology theory by Voevodsky Suslin Rost and others. Assuming only a solid background in algebra but no homological algebra the book covers the basic theory of central simple algebras methods of Galois descent and Galois cohomology Severi-Brauer varieties residue maps and finally Milnor K-theory and K-cohomology. The last chapter rounds off the theory by presenting the results in positive characteristic including the theorem of Bloch-Gabber-Kato. The book is suitable as a textbook for graduate students and as a reference for researchers working in algebra algebraic geometry or K-theory.

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Alina Carmen Cojocaru & M. Ram Murty

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2. Some elementary sieves;
3. The normal order method;
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5. The sieve of Eratosthenes;
6. Brun’s sieve;
7. Selber’s sieve;
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Bela Bollobás

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ICM Edition

Claire Voisin

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Uwe Franz & Adam Skalski

Noncommutative mathematics is a significant new trend of mathematics. Initially motivated by the development of quantum physics, the idea of, making theory noncommutative, has been extended to many areas of pure and applied mathematics. This book is divided into two parts. The first part provides an introduction to quantum probability, focusing on the notion of independence in quantum probability and on the theory of quantum stochastic processes with independent and stationary increments. The second part provides an introduction to quantum dynamical systems, discussing analogies with fundamental problems studied in classical dynamics. The desire to build an extension of the classical theory provides new, original ways to understand well-known commutative, results. On the other hand the richness of the quantum mathematical world presents completely novel phenomena, never encountered in the classical setting. This book will be useful to students and researchers in noncommutative probability, mathematical physics and operator algebras.

Contents: Preface; Introduction; 1. Independence and Lévy Processes in Quantum Probability; 2. Quantum Dynamical Systems from the Point of View of Noncommutative Mathematics; Index.

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Rational and Nearly Rational Varieties
Janos Kollar, Karen E. Smith & Alessio Corti

The most basic algebraic varieties are the projective spaces, and rational varieties are their closest relatives. In many applications where algebraic varieties appear in mathematics and the sciences, we see rational ones emerging as the most interesting examples. The authors have given an elementary treatment of rationality questions using a mix of classical and modern methods. Arising from a summer school course taught by János Kollár, this book develops the modern theory of rational and nearly rational varieties at a level that will particularly suit graduate students. There are numerous examples and exercises, all of which are accompanied by fully worked out solutions, that will make this book ideal as the basis of a graduate course. It will act as a valuable reference for researchers whilst helping graduate students to reach the point where they can begin to tackle contemporary research problems.


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This is the second of two volumes which will provide an introduction to modern developments in the representation theory of finite groups and associative algebras. The subject is viewed from the perspective of homological algebra and the theory of representations of finite dimensional algebras; the author emphasises modular representations and the homological algebra associated with their categories. This volume concentrates on the cohomology of groups, always with representations in view; however, it begins with a background reference chapter, then proceeds to an overview of the algebraic topology and K-theory associated with cohomology of groups, especially the work of Quillen. Later chapters look at algebraic and topological proofs of the finite generation of the cohomology ring of a finite group, and an algebraic approach to the Steenrod operations in group cohomology. The book culminates in a chapter dealing with the theory of varieties for modules. Much of the material presented here has never appeared before in book form. Consequently students and research workers studying group theory, and indeed algebra in general, will be grateful to Dr Benson for supplying an exposition of a good deal of the essential results of modern representation theory.

Contents: Conventions and notations; Introduction; 1. Background material from algebraic topology; 2. Cohomology of groups; 3. Spectral sequences; 4. The Evens norm map and the Steenrod algebra; 5. Varieties for modules and multiple complexes; 6. Group actions and the Steinberg module; 7. Local coefficients on subgroup complexes; Bibliography; Index

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James H. Davenport

The theory of numbers is generally considered to be the 'purest' branch of pure mathematics and demands exactness of thought and exposition from its devotees. It is also one of the most highly active and engaging areas of mathematics. Now into its eighth edition The Higher Arithmetic introduces the concepts and theorems of number theory in a way that does not require the reader to have an in-depth knowledge of the theory of numbers but also touches upon matters of deep mathematical significance. Since earlier editions, additional material written by J. H. Davenport has been added, on topics such as Wiles' proof of Fermat's Last Theorem, computers and number theory, and primality testing. Written to be accessible to the general reader, with only high school mathematics as prerequisite, this classic book is also ideal for undergraduate courses on number theory, and covers all the necessary material clearly and succinctly.

Contents: Introduction; 1. Factorization and the primes; 2. Congruences; 3. Quadratic residues; 4. Continued fractions; 5. Sums of squares; 6. Quadratic forms; 7. Some Diophantine equations; 8. Computers and number theory; Exercises; Hints; Answers; Bibliography; Index; Additional notes

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Statistical Survey Design and Evaluating Impact
Taran Kumar Roy

Sample surveys are a popular and viable alternative to official statistics and censuses. They are being increasingly used to collect detailed information on population characteristics. This book discusses some important methodologies to design sample surveys and impact evaluation. There are solved examples included in the book to illustrate each technique covered. The authors have also provided interesting case studies from different parts of the world to highlight applications of these techniques. Sources of biases and ways to overcome them are outlined in a clear and concise manner. In addition, there are clear guidelines with remedial measures to facilitate choosing a suitable sampling design among many alternatives. The book will appeal to graduate students and researchers in the areas of statistics, quantitative social sciences, population studies and epidemiology.


ISBN: 9781107146457 286pp HB ₹ 725.00
This 1996 book is a comprehensive account of the theory of Lévy processes. This branch of modern probability theory has been developed over recent years and has many applications in such areas as queues, mathematical finance and risk estimation. Professor Bertoin has used the powerful interplay between the probabilistic structure (independence and stationarity of the increments) and analytic tools (especially Fourier and Laplace transforms) to give a quick and concise treatment of the core theory, with the minimum of technical requirements. Special properties of subordinators are developed and then appear as key features in the study of the local times of real-valued Lévy processes and in fluctuation theory. Lévy processes with no positive jumps receive special attention, as do stable processes. In sum, this will become the standard reference on the subject for all working probability theorists.

Contents: Preliminaries; 1. Lévy processes as Markov processes; 2. Elements of potential theory; 3. Subordinators; 4. Local time and excursions of a Markov process; 5. Local times of a Lévy process; 6. Fluctuation theory; 7. Lévy processes with no positive jumps; 8. Stable processes and the scaling property; Bibliography; Glossary; Index

ISBN: 9780521770048 275pp PB ₹ 495.00

The third edition of this highly acclaimed undergraduate textbook is suitable for teaching all the mathematics ever likely to be needed for an undergraduate course in any of the physical sciences. As well as lucid descriptions of all the topics covered and many worked examples, it contains more than 800 exercises. A number of additional topics have been included and the text has undergone significant reorganisation in some areas. New stand-alone chapters:

• give a systematic account of the ‘special functions’ of physical science
• cover an extended range of practical applications of complex variables including WKB methods and saddle-point integration techniques
• provide an introduction to quantum operators.

Further tabulations, of relevance in statistics and numerical integration, have been added. In this edition, all 400 odd-numbered exercises are provided with complete worked solutions in a separate manual, available to both students and their teachers; these are in addition to the hints and outline answers given in the main text. The even-numbered exercises have no hints, answers or worked solutions and can be used for unaided homework; full solutions to them are available to instructors on a password-protected website.


ISBN: 9781107664173 566pp PB ₹ 995.00

This classic textbook offers a clear exposition of modern probability theory and of the interplay between the properties of metric spaces and probability measures. The first half of the book gives an exposition of real analysis: basic set theory, general topology, measure theory, integration, an introduction to functional analysis in Banach and Hilbert spaces, convex sets and functions and measure on topological spaces. The second half introduces probability based on measure theory, including laws of large numbers, ergodic theorems, the central limit theorem, conditional expectations and martingale’s convergence. A chapter on stochastic processes introduces Brownian motion and the Brownian bridge. The edition has been made even more self-contained than before; it now includes a foundation of the real number system and the Stone-Weierstrass theorem on uniform approximation in algebras of functions. Several other sections have been revised and improved, and the comprehensive historical notes have been further amplified. A number of new exercises have been added, together with hints for solution.


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Mathematics / Statistics

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Ajit Kumar

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The mathematical tools developed will help in understanding the difficulties encountered in classical physics while trying to explain the experimental results involving atomic spectra and other phenomena. The differential equations that arise while solving eigenvalue problems are solved rigorously, to make the text self-sufficient. The solutions are then physically interpreted and explained.

Contents: Preface; Acknowledgment; Chapter 1: Introduction; Chapter 2: The Postulates of Quantum Mechanics; Chapter 3: One-Dimensional Problems; Chapter 4: Quantum Mechanics in Three Spatial Dimensions; Chapter 5: Quantum Mechanical Theory of Angular Momentum; Chapter 6: Simple Magnetic Field Effects; Chapter 7: Addition of Angular Momenta; Chapter 8: Quantum Mechanics of Many Particle Systems; Chapter 9: Symmetry and Conservation Laws; Chapter 10: Relativistic Wave Equations; References

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Ordinary Differential Equations
Principles and Applications
A K Nandakumaran, P S Datti, Raju K George

The book offers detailed treatment on fundamental concepts of ordinary differential equations. Important topics including first and second order linear equations, initial value problems and qualitative theory are presented in separate chapters. The concepts of physical models and first order partial differential equations are discussed in detail in this text. It covers two-point boundary value problems for second order linear and nonlinear equations. Using two linearly independent solutions, a Green's function is constructed for given boundary conditions. The text emphasizes on use of calculus concepts in justification and analysis of equations to get solutions in explicit form. While discussing first order linear systems, tools from linear algebra are used and the importance of these tools is clearly explained in the book. The real life applications are interspersed throughout the book. The methods and tricks to solve numerous mathematical problems with sufficient derivations and explanation are provided. The proofs of theorems are explained for the benefit of the readers.

Contents: Preface; Acknowledgment; Chapter 1. Introduction and Examples: Physical Models; Chapter 2. Preliminaries; Chapter 3. First and Second Order Linear Equations; Chapter 4. General Theory of Initial Value Problems; Chapter 5. Linear Systems and Qualitative Analysis; Chapter 6. Series Solution: Frobenius Theory; Chapter 7. Regular Sturm-Liouville Theory; Chapter 8. Qualitative Theory; Chapter 9 Two Point Boundary Value Problems; Chapter 10. First Order Partial Differential Equations: Method of Characteristics; Bibliography; Index

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Keith Wilson & John Walker (editors)

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Robert Edward Lee

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An Introduction to Phycology
Christiaan van den Hoek, David Mann & H. M. Jahns

Algae are ubiquitous. A multitude of species, ranging from microscopic unicells to gigantic kelps, inhabit the world’s oceans, freshwater bodies, soils, rocks and trees. To understand the basic role of algae in the global ecosystem, a reliable and modern introduction to their kaleidoscopic diversity, systematics and phylogeny is indispensable. This volume provides such an introduction. The text represents a completely revised and updated edition of a highly acclaimed German textbook which was heralded for its clarity as well as its breadth and depth of information. This new edition takes into account recent re-evaluations in algal systematics and phylogeny which have been made necessary by insights provided by the powerful techniques of molecular genetics and electron microscopy, as well as more traditional life history studies.


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Biotechnology is the major technology of the 21st century, yet few people realise how much it impacts on many aspects of human society. The defining aim of this new fifth edition is to re-establish the correct understanding of the term biotechnology. Using the straightforward style that made the previous editions of his textbook so popular, John Smith once again helps students with the deciphering and use of biological knowledge. He explains the historical developments in biotechnology and the range of activities from brewing beer, the treatment of sewage and other wastes, and the creation of biofuels. He also discusses the innovations in molecular biology, genomics and proteomics, systems biology and their impact on new biotechnology. In this edition, John Smith also re-examines the ethics and morality of aspects of biotechnology and puts new emphasis on stem cells and regenerative medicine and micro RNA.


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Biotechnology Fifth Edition
John Smith

The Insects Structure and Function Fifth Edition
R. F. Chapman, Stephen J. Simpson & Angela E. Douglas (editors)
General Microbiology
Seventh Edition
Hans G. Schlegel

This revised, up-dated and expanded edition of Professor Schlegel’s well-established textbook provides an excellent introduction to microbiology for a wide range of undergraduate students. This new edition includes new species, new phylogenetic relationships and a greater emphasis on environmental and ecological matters, whilst retaining the traditional strengths of the previous edition.


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Rex A. Dwyer

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Basic Biotechnology
Third Edition
Colin Ratledge & Bjorn Kristiansen (editors)

Biotechnology is one of the major technologies of the twenty-first century. Its wide-ranging, multidisciplinary activities include recombinant DNA techniques, cloning and the application of microbiology and other cell culture technologies to the production of a wide range of goods from bread to antibiotics. It continues to revolutionise treatments of many diseases, and is used to provide clean technologies and to deal with environmental problems. Basic Biotechnology uniquely combines biology and bioprocessing topics to provide a complete overview of biotechnology. It explains the fundamental principles that underpin all biotechnology and provides a full range of examples showing how these principles are applied; from starting substrate to final product. Distinctive features of this text are the discussions of the public perception of biotechnology and the business of biotechnology, which set the science in a broader context. This comprehensive text is essential reading for all students and practitioners of biotechnology, and for researchers in biotechnology industries.

The authors present a basic and accessible introduction to the world of microbiology. It covers the structure and functioning of microbes, as well as the methods used to culture, control, identify and study them. This book is essential reading for anyone becoming interested in this subject.

Contents: General Preface to the Series; Preface; 1. Microbial structure and mode of life; 2. Handling microbes; 3. Isolation, classification and identification of microbes; Further reading; Glossary; Index.

ISBN: 9788175961036 234pp PB ₹ 295.00

Knowledge in microbiology is growing exponentially through the determination of genomic sequences of hundreds of microorganisms and the invention of new technologies such as genomics, transcriptomics, and proteomics, to deal with this avalanche of information. These genomic data are now exploited in thousands of applications, ranging from those in medicine, agriculture, organic chemistry, public health, biomass conversion, to biomining. Microbial Biotechnology: Fundamentals of Applied Microbiology focuses on uses of major societal importance, enabling an in-depth analysis of these critically important applications. Some, such as wastewater treatment, have changed only modestly over time, others, such as directed molecular evolution, or 'green' chemistry, are as current as today’s headlines. This fully revised second edition provides an exciting interdisciplinary journey through the rapidly changing landscape of discovery in microbial biotechnology.


ISBN: 9780521729673 576pp HB ₹ 695.00

This book is a comprehensive guide to all of the mathematics, statistics and computing you will need to successfully operate DNA microarray experiments. The book covers all aspects of microarray bioinformatics, giving you the tools to design arrays and experiments, to analyze your data, and to share your results with your organisation or with the international community. There are chapters covering sequence databases, oligonucleotide design, experimental design, image processing, normalisation, identifying differentially expressed genes, clustering, classification and data standards.


ISBN: 9780521670500 277pp PB ₹ 595.00

Essential Bioinformatics is a concise yet comprehensive textbook of bioinformatics that provides a broad introduction to the entire field. Written specifically for a life science audience, the basics of bioinformatics are explained; followed by discussions of the state-of-the-art computational tools available to solve biological research problems. All key areas of bioinformatics are covered including biological databases, sequence alignment, genes and promoter prediction, molecular phylogenetics, structural bioinformatics, genomics, and proteomics. The book emphasizes how computational methods work and compares the strengths and weaknesses of different methods. This balanced yet easily accessible text will be invaluable to students who do not have sophisticated computational backgrounds. Technical details of computational algorithms are explained with a minimum use of mathematical formulas; graphical illustrations are used in their place to aid understanding. The effective synthesis of existing literature as well as in-depth and up-to-date coverage of all key topics in bioinformatics make this an ideal textbook for all bioinformatics courses taken by life science students and for researchers wishing to develop their knowledge of bioinformatics to facilitate their own research.

Contents: Preface; Part I: Introduction and Biological Databases; 1. Introduction; 2. Introduction to biological databases; Part II: Sequence Alignment; 3. Pairwise sequence alignment; 4. Database similarity search; 5. Multiple sequence alignment; 6. Profiles and hidden Markov models; 7. Protein motifs and
Fundamental Genetics is a concise, nontraditional textbook that explains major topics of modern genetics in 42 mini-chapters. It is designed as a textbook for an introductory general genetics course. Fundamental Genetics is also a useful reference or refresher on basic genetics for professionals and students in health sciences and biological sciences. It is organized for ease of learning, beginning with molecular structures and progressing through molecular processes to population genetics and evolution. Students will find the short, focused chapters approachable and more easily digested than the long, more complex chapters of traditional genetics textbooks. Each chapter concentrates on one topic, so that teachers and students can readily tailor the book to their needs by choosing a subset of chapters. The book is extensively illustrated throughout with clear and uncluttered diagrams that are simple enough to be re-drawn by students. This unique textbook provides a compact alternative for introductory genetics courses.


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D.J. Mabberley

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Contents: Preface; How to use this book; The dictionary; System for arrangement of vascular plants; Acknowledgement of sources; Abbreviations.

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Gene Cloning and Manipulation
Second Edition
Christopher Howe

Now fully updated to reflect recent advances, this introduction provides a broad, but concise, coverage of recombinant DNA techniques. Written for advanced undergraduates, graduates and scientists who want to use this technology, emphasis is placed on the concepts underlying particular types of cloning vectors to aid understanding and to enable readers to devise suitable strategies for novel experimental situations. An introduction to the basic biochemical principles is presented first. Then PCR and cloning using E. coli hosts and plasmid, phage and hybrid vectors are described, followed by the generation and screening of libraries and how to modify, inactivate or express cloned sequences. Finally genetic manipulation in a range of other organisms is discussed, including other bacteria, fungi, algae and plants, insects and mammals. A series of 'real-life' biological problems are also presented to enable readers to assess their understanding of the material and to prepare for exams.


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Bacterial Genomics
Genome Organization and Gene Expression Tools
Aswin Sai Narain Seshasayee

The study of bacterial genetics has revolutionized with the development of genome sequencing, which let us catalogue the gene content of various clinically and industrially important bacteria and opened up the field of comparative genomics. The research findings on bacterial genetics were further enhanced by the development of allied techniques that allowed interrogation of the interactions and functions of the many components of genome. These developments accelerated with the widespread adoption of quantitative deep-sequencing approaches. This process allowed both comparative and functional genomics on an unprecedented scale by presenting powerful tools to investigate multiple layers of bacterial adaptation and evolution. This book presents the application of genomic tools to examine bacterial adaptation. The emphasis is on data analysis and interpretation. Much of the material is drawn from the recent, primary literature, which is the most powerful tool in the cutting-edge and fast-growing field of bacterial research.

Sales points
• Discusses the application of genomic tools in study of bacterial adaptation
• Detailed treatment of Metagenomics and Bacterial Gene Expression tools
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Genes, Cells and Brains
The Promethean Promises of the New Biology
Hilary Rose and Steven Rose

Our fates lie in our genes and not in the stars, said James Watson, co-discoverer of the structure of DNA. But Watson could not have predicted the scale of the industry now dedicated to this new frontier. Since the launch of the multibillion-dollar Human Genome Project, the biosciences have promised miraculous cures and radical new ways of understanding who we are. But where is the new world we were promised? Now updated with a new afterword, this book asks why the promised cornucopia of health benefits has failed to emerge and reveals the questionable enterprise that has grown out of bioethics. The authors, feminist sociologist Hilary Rose and neuroscientist Steven Rose, examine the establishment of biobanks, the rivalries between public and private gene sequencers, and the rise of stem cell research. The human body is becoming a commodity, and the unfulfilled promises of the science behind this revolution suggest profound failings in genomics itself.


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Promises of the New Biology
The Promethean
Brains
Hilary Rose
and
Steven Rose

Now fully updated to reflect recent advances, this introduction provides a broad, but concise, coverage of recombinant DNA techniques. Written for advanced undergraduates, graduates and scientists who want to use this technology, emphasis is placed on the concepts underlying particular types of cloning vectors to aid understanding and to enable readers to devise suitable strategies for novel experimental situations. An introduction to the basic biochemical principles is presented first. Then PCR and cloning using E. coli hosts and plasmid, phage and hybrid vectors are described, followed by the generation and screening of libraries and how to modify, inactivate or express cloned sequences. Finally genetic manipulation in a range of other organisms is discussed, including other bacteria, fungi, algae and plants, insects and mammals. A series of 'real-life' biological problems are also presented to enable readers to assess their understanding of the material and to prepare for exams.


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Paleobotany and the Evolution of Plants
Stewart

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Martin J. Tovee

In recent years there has been a host of new advances in our understanding of how we see. From molecular genetics come details of the photopigments and the molecular causes of disorders like colour blindness. In-depth analysis has shown how a cell converts light into a neural signal using the photopigments. Traditional techniques of microelectrode recording along with new techniques of functional imaging - such as PET scans - have made it possible to understand how visual information is processed in the brain. This processing results in the single coherent perception of the world we see in our 'mind's eye'. An Introduction to the Visual System provides a concise but detailed overview of this field. It is clearly written and each chapter ends with a helpful 'key points' section. It is ideal for anyone studying visual perception from the second year of an undergraduate course onwards.


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Wolves excitedly greet each other as members of the pack come together; a bumble bee uses its long tongue to reach the nectar at the base of a foxglove flower; a mongoose swiftly and deftly bites its prey to death; young cheetahs rest quietly together, very close to sleep. Now in full colour, this revised and updated edition of Manning and Dawkins classic text provides a beautifully written introduction to the fundamentals of animal behaviour. Tinbergen’s four questions of causation, evolution, development and function form the fundamental framework of the text, illustrated with fascinating examples of complex behavioural mechanisms. The authors provide accounts of all levels of behaviour from the nerve cell to that of the population. The strengths of An Introduction to Animal Behaviour as a textbook include its clear explanations and concise, readable text and the enthusiasm of the authors for their subject.


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M. S. Swaminathan

Food security can be achieved only through concurrent attention to food availability, access and absorption. It needs synergy between food and non-food factors: clean drinking water, sanitation, primary healthcare and the purchasing power. The future of food security will depend on a combination of the ecological prudence of the past and the technological advances of today and tomorrow. The issues that need to be addressed in combating hunger and achieving food security are highlighted in this book by a great Indian geneticist. The genesis and growth of the yield revolution is traced at the beginning in order to give readers, particularly the younger generation, an understanding of efforts that ushered in the Green Revolution of the 1960s.


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David C Sige

Bringing together bacterial structure and function, taxonomy, environmental microbiology, induction and development of plant disease, molecular genetics and disease control, Dr Sige unifies the field, at the same time as emphasising exciting developments in cell and molecular biology. The book is written in a clear and concise manner, illustrated with numerous tables, diagrams and photographs.


ISBN: 9781107633520 340pp PB ₹ 950.00

The Systems View of Life
Fritjof Capra, Pier Luigi Luisi

Over the past thirty years, a new systemic conception of life has emerged at the forefront of science. New emphasis has been given to complexity, networks, and patterns of organisation leading to a novel kind of ‘systemic’ thinking. This volume integrates the ideas, models, and theories underlying the systems view of life into a single coherent framework. Taking a broad sweep through history and across scientific disciplines, the authors examine the appearance of key concepts such as autopoiesis, dissipative structures, social networks, and a systemic understanding of evolution. The implications of the systems view of life for health care, management, and our global ecological and economic crises are also discussed. Written primarily for undergraduates, it is also essential reading for graduate students and researchers interested in understanding the new systemic conception of life and its implications for a broad range of professions - from economics and politics to medicine, psychology and law.


ISBN: 9781107123113 HB ₹ 575.00

Economics of Tropical Farming Systems
CLPE
Martin Upton

Based on the author’s widely used earlier text African Farm Management, this account updates the economic analysis of tropical agriculture and includes examples from all parts of the developing world. Written in a clear, concise style, Professor Upton explains the essential theories of farm economics without numerous mathematical formulae. This account is completely revised, with increased emphasis on ‘farm household economics’, in which farms are seen as consumers as well as producers. Containing a new chapter on the economics of irrigated agriculture, this book provides an invaluable economic framework for better understanding the management of farming systems in the tropics, and will be welcomed by students of tropical agriculture worldwide.


ISBN: 9780521635110 384pp PB ₹ 325.00

The Systems View of Life
This rigorous yet accessible text introduces the key physical and biochemical processes involved in plant interactions with the aerial environment. It is designed to make the more numerical aspects of the subject accessible to plant and environmental science students, and will also provide a valuable reference source to practitioners and researchers in the field. The third edition of this widely recognised text has been completely revised and updated to take account of key developments in the field. Approximately half of the references are new to this edition and relevant online resources are also incorporated for the first time. The recent proliferation of molecular and genetic research on plants is related to whole plant responses, showing how these new approaches can advance our understanding of the biophysical interactions between plants and the atmosphere. Remote sensing technologies and their applications in the study of plant function are also covered in greater detail.


ISBN: 9781107521445 510pp PB ₹ 799.00

The predictability of the physical arrangement of plants at whatever scale it is viewed is referred to as their spatial pattern. Spatial pattern is a crucial aspect of vegetation which has important implications not only for the plants themselves but also for other organisms which interact with plants such as herbivores and pollinators or those animals for which plants provide a habitat. This book describes and evaluates methods for detecting and quantifying a variety of characteristics of spatial pattern. As well as discussing the concepts on which these techniques are based examples from real field studies and worked examples are included which together with numerous line figures help guide the reader through the text. The result is a book that will be of value to graduate students and research workers in the fields of vegetation science conservation biology and applied ecology.


ISBN: 9780521794374 PB ₹ 975.00

Ecology: Principles and Applications is a comprehensive textbook for A-level students and first-year undergraduates taking courses in biology geography and Earth sciences who require an introduction to ecology. Studies of human ecology are integrated into the text and the links to related disciplines are emphasised. The text begins with the ecology of individual organisms and moves on through communities and ecosystems to global considerations of biogeography co-evolution and conservation. Case histories historical perspectives controversial theories and extension material are highlighted throughout the book. The second edition has been brought up to date with current syllabuses by the addition of further material on the key issue of conservation giving excellent coverage of the principles of conservation and using case studies to provide examples of conservation policies in practice. The authors are experienced teachers of ecology at sixth form and undergraduate level.


ISBN: 9780521689205 PB ₹ 695.00
Environmental Studies – as a compulsory paper for undergraduate students of all disciplines – introduces the fundamental principles and concepts of environmental science, ecology and related interdisciplinary topics like policy, law, pollution control, economics and natural resource management. This textbook of Environmental Studies covers a wide range of concepts and issues including biodiversity, global warming, acid rain, ozone layer depletion, nuclear accidents, nuclear holocaust, disaster management, etc. Focusing on the immediate need for public awareness, it discusses the use and manipulation of various natural resources such as water, land, forests, food and mineral resources and the problems associated with natural resource management. It also analyses different types of ecosystems, biogeochemical cycles and the laws of thermodynamics with easy-to-understand examples. In addition, the book has separate chapters on various types of environmental pollution and waste management including waste water treatment, solid waste management and green management.


Climate Change

The second edition of this acclaimed text has been fully updated and substantially expanded to include the considerable developments (since publication of the first edition) in our understanding of the science of climate change, its impacts on biological and human systems, and developments in climate policy. Written in an accessible style, it provides a broad review of past, present and likely future climate change from the viewpoints of biology, ecology, human ecology and Earth system science. It will again prove to be invaluable to a wide range of readers, from students in the life sciences who need a brief overview of the basics of climate science, to atmospheric science, geography, geoscience and environmental science students who need to understand the biological and human ecological implications of climate change. It is also a valuable reference text for those involved in environmental monitoring, conservation and policy making.

Machine Learning Methods in the Environmental Sciences

Machine learning methods originated from artificial intelligence and are now used in various fields in environmental sciences today. This is the first single-authored textbook providing a unified treatment of machine learning methods and their applications in the environmental sciences. Due to their powerful nonlinear modelling capability, machine learning methods today are used in satellite data processing, general circulation models (GCM), weather and climate prediction, air quality forecasting, analysis and modelling of environmental data, oceanographic and hydrological forecasting, ecological modelling, and monitoring of snow, ice and forests. The book includes end-of-chapter review questions and an appendix listing web sites for downloading computer code and data sources. A resources website containing datasets for exercises, and password-protected solutions are available. The book is suitable for first-year graduate students and advanced undergraduates. It is also valuable for researchers and practitioners in environmental sciences interested in applying these new methods to their own work.


Fundamentals of Environmental Studies

Mahua Basu & S. Xavier

Climate Change

Biological and Human Aspects

Second Edition

Jonathan Cowie

Machine Learning Methods in the Environmental Sciences

Neural Networks and Kernels

William W. Hsieh

Environmental Sciences

ISBN: 9781107536173 464pp PB ₹ 350.00

ISBN: 9781107619210 578pp PB ₹ 895.00

ISBN: 9780521181914 364pp PB ₹ 595.00
Introduction to Modern Climate Change
Andrew Dessler

This textbook is tightly focused on the problem of anthropogenic climate change. It is unique among textbooks on climate change in that it combines an introduction of the science with an introduction to the non-scare issues such as the economic and policy options. Unlike more purely descriptive textbooks it contains the quantitative depth that is necessary for an adequate understanding of the science of climate change. The goal of the book is for a student to leave the class ready to engage in the public policy debate on this issue. This is an invaluable textbook for any introductory course on the science and policy of climate change for both non-science majors and introductory science students.

**Contents:**

ISBN: 9781107608696 252pp PB ₹ 595.00
67 b/w illus. 11 colour illus. 6 maps 5 tables 120 exercises

Dew Harvest
To Supplement Drinking Water Sources in Arid Coastal Belt of Kutch
Girja Sharan

Dew Harvest deals with dew harvesting as a feasible solution to the chronic water scarcity in arid areas near the coastline. It substantiates the methodology of dew harvesting based on a case study from the Kothara village in the Kutch region. The book provides insights into the simple and people friendly technology of dew harvesting. It explains the exemplary procedure that Prof. Sharan followed: study of the dew resource of the site chemical analysis of dew water to verify potability test of dew harvesting materials construction of small and plot-sized dew condensers and ultimately the construction of a large dew production plant. The author describes the methodology involved in the measurement of dewfall throughout India especially in the coastal regions. He recommends that dew harvesting be part of the curriculum at colleges and urges hydrologists and engineers to seriously consider its utility as an innovative technology. This book is the summary of present technology to harvest dew water through simple and inexpensive means.

**Contents:**

ISBN: 9788175963269 107pp PB ₹ 295.00

Elasticity and Geomechanics
R. O. Davis & A. P. S. Selvadurai (Eds.)

This book concisely examines the use of elasticity in solving geotechnical engineering problems. In a highly illustrated and user-friendly format it provides a thorough grounding in the linear theory of elasticity and an understanding of the applications for upper level students in civil engineering and engineering geology. The first two chapters present a basic framework of the theory of elasticity and describe test procedures for the determination of elastic parameters for soils. Chapters 3 and 4 present the fundamental solutions of Boussinesque Kelvin and Mindlin and use these to formulate solutions to problems of practical interest in geotechnical engineering. The book concludes with a sequence of appendices designed to provide the interested student with details of elasticity theory which are peripheral to the main text. Each chapter includes a set of questions for the student to answer.

**Contents:**

ISBN: 9781107447448 216pp PB ₹ 495.00
131 b/w illus. 2 tables 38 exercises

Understanding Environmental Pollution
A Primer
Marquita K. Hill

Understanding Environmental Pollution systematically introduces pollution issues to students and others with little scientific background. The first edition received excellent reviews and the new edition has been completely refined and updated. The book moves from the definition of pollution and how pollutants behave to air and water pollution basics pollution and global change solid waste and pollution in the home. It also discusses persistent and bioaccumulative chemicals and pesticides and it places greater stress on global pollutants. The relationship between energy generation and use and pollution is stressed as well as the importance of going beyond pollution control to pollution prevention. Impacts on human and environmental health are emphasized throughout. Students are often invited to come to their own conclusions after having been presented with a variety of opinions. This textbook provides the basic concepts of pollution toxicoLOGY and risk assessment for non-science majors as well as environmental science students.

**Contents:**

ISBN: 9780521670388 484pp PB ₹ 795.00
69 b/w illus. 42 tables
On Disasters in India

Anu Kapur

On Disasters in India is a comprehensive compilation of extensive research on disasters in India. It unfolds the pitfalls in research so far and insists on a fresh paradigm in the methodology for accessing research on disasters. The book reconstructs a researchscape and examines the three time periods of study of disasters namely the phase of awareness indifference and recognition. The narrative is built across the colonial independence and post-globalisation years. The 4004 references located classified and collated figuratively and categorically in the book form the groundwork for any research pertaining to disasters in India. The collection is indispensable to postgraduate students researchers disaster managers and policymakers who are keenly involved in research or in providing solutions to disasters.

Contents: Acknowledgements; Introduction; Before 4004; The Search; Research on Research; Evolution of the Study of Natural Disasters in India; The 4004; Back to the Future of 4004; References; List of figures; List of tables

ISBN: 9788175966222 406pp HB ₹ 995.00

Sustainable Development at Risk

Ignoring the Past

Joseph H Hulse

Over the past half century the idea of sustainable development has evolved and rooted itself in the lexicon on international development. But what is it really? Are development agencies truly committed to longterm sustainable solutions to development issues? Are we learning from our past successes and failures? This book takes an historical perspective on these questions. The analysis begins with the Atlantic Charter the creation of the United Nations; its family of agencies and the international development banks. It reviews recommendations from international commissions and conferences from World Bank and UNDP development reports. It comments on governmental policies human and industrial actions detrimental to the planet’s environment and natural resources. It studies the patterns by which biotechnologies essential to human survival and health have progressed over the past 6000 years and the consequences of uncontrolled urban growth on food and health security.


international monetary system The UN and its Specialised Agencies Liberation from colonialism Colonisation of Africa Conflict in the Middle East International development conferences Purposes of international development programmes Assessments of international development programmes World Bank Development Reports Comment on World Bank Development Reports UNDP Human Development Reports Final Observation 4 From Pearson to Johannesburg The Pearson Commission The Brandt Commission The Brundtland Commission Pearson Brandt and Brundtland International conferences on environment and development The UN World Summit on Sustainable Development (WSSD) Final Observation 5 Poverty Poverty and development Poverty and World Bank Development Reports Empowerment Security Constraints to trade and hopes for reform UNDP Human Development recommendations General comment 6 Development in Agriculture and Biotechnologies Sustainable survival Agriculture and biotechnologies Evolution of Planet Earth Hunting and gathering Early hominid diets From hunting to settled agriculture Demographic and social change: the river valley civilisations Roman agriculture From empiricism to scientific agriculture From alchemy to chemistry Taxonomic classification Mendal Closing comment 7 Sustainable Agriculture Diverse and divergent concepts Other commentaries and recommendations Conservation and preservation Agricultural resources Variations on the sustainable theme Chemical fertilisers Contentious issues International agricultural research: the CGIAR Genetic modifications GM crops: potential benefits Closing comment 8 Sustainable Food Security Diverse definitions Food security income and poverty Strategic food stocks Nutritional adequacy - Urban growth and food security Final observation 9 Industrial Biotechnologies Biotechnologies: definition and evolution Beginnings of biotechnologies Food preservation From hand labour to mechanisation Science applied to biotechnologies Evolution of pharmaceuticals Food and pharmaceutical industries Influence of supermarkets Industrial biotechnologies: changing patterns and future prospects Biomedical industries Bio-informatics Industrial biotechnologies: trends and prospects - Process of preservation Final comment 10 Environment and resources The planet’s creation and evolution Governance of environments and resources Are resources sustainable? Confusion of carrying capacity The people that on Earth do dwell Energy Atmospher and climate Water Final comment 11 Case Studies of Successful Projects The Canada-Mysore Project Farming systems research - IDRC initiatives Ilo-Ilo and diversifying FSR Comment from M S Swaminathan Employment in rural agribusiness The MSSRF Biovillage programme VGKK/ KT-CFTRI health and employment programme Focus on semi-arid tropics Post-production systems Social forestry and agroforestry Local management of water Essential health in Tanzania Making waves -
escaping the tsunami 12 Political and Ideological Issues Systems of governance Unsustained political priorities A donor’s vacillating policies Concepts of democracy What is the purpose of human existence? Religion and politics Unsustained and unsustainable political systems India’s potential in world affairs Political participation in national development Governments and industrial research and development 13 Ethics Communications and Education Ethical issues and concepts Ethics in biotechnologies Potential benefits from genetic modifications - Functional genomics Ethics and sustainable bio-industries Ethics in international trade Centralised versus decentralised management Summary and conclusion Human resource development Language and communications Evolution of the means of communication Neglect of development progress Epilogue Glossary of biotechnologies References

Organic Farming
G.K. Veeresh

Green Revolution Technologies have made India self-sufficient in food production but unable to sustain soil productivity. A quantum leap in production of over 100 million tonnes was achieved in just two decades (1960-1970). But during the 1980s and 1990s it was a struggle to add on another 10 million tonnes despite good monsoons and the increasing supply of inputs of fertilizers high yielding seeds pesticides as well as water through irrigation. High costs of inputs have turned farming into a loss-making enterprise while leading to severe environmental degradation.

Contents: Foreword Acknowledgements Preface; Chapter 1. Climate and Some Related Global Phenomena; Chapter 2. Radiation and Greenhouse Gases; Chapter 3. Global Evidences of Changes in Climate and Environment; Chapter 4. Evidences of Climatic and Environmental Changes in India; Chapter 5. Possible Impacts of Climate Change in India; Chapter 6. Clean Technology and Energy Chapter 7 Mitigation Efforts by the Government of India; Chapter 8. Issues of Concern in Some Important Sectors; Chapter 9. Uncertainties and Possible Approaches; Appendices; References

ISBN: 9788175965331 280pp HB ₹ 600.00

Climate Change
An Indian Perspective
Sushil Kumar Dash

The disturbing changes occurring in the global climate and environment has been a matter of concern for the current generation. The exploration and exploitation of nature by human beings have placed tremendous and undue stress on the natural resources. Some of the recent signals of global changes warrant reconsideration of the whole concept of industrial growth that has been adopted so far. The issue of climate change due to human activities can be analysed under two broad categories: emissions of Greenhouse Gases (GHGs) and the nearly irreversible damage to the environment. Reducing emissions of GHGs is intimately connected with economic issues and hence a matter of global politics. It needs to be handled through global negotiations and ultimately through the use of alternate sources of energy and clean technology. The second category is more dangerous since the recovery process will be extremely slow and the corrective measures more complicated than those for the GHG abatement. Large-scale mass movements and not mere government policies or laws are necessary to tackle this factor. The study of climate change encompasses various disciplines viz. science social science management administration and law. With a view to integrating these multidimensional aspects and bringing together the scientific issues factual reports and peoples’ perceptions about climate change this book has taken into account published books scientific journals and reports as well as articles written in periodicals and newspapers. The author hopes that this book will help the readers to be aware of various facets of our climate system and the difficulties in assessing the changes occurring in the earth-atmosphere-ocean system and in adopting suitable methods to mitigate them.

Contents: Foreword Acknowledgements Preface; Chapter 1. Climate and Some Related Global Phenomena; Chapter 2. Radiation and Greenhouse Gases; Chapter 3. Global Evidences of Changes in Climate and Environment; Chapter 4. Evidences of Climatic and Environmental Changes in India; Chapter 5. Possible Impacts of Climate Change in India; Chapter 6. Clean Technology and Energy Chapter 7 Mitigation Efforts by the Government of India; Chapter 8. Issues of Concern in Some Important Sectors; Chapter 9. Uncertainties and Possible Approaches; Appendices; References

ISBN: 9788175965218 392pp HB ₹ 695.00
It is now widely recognized that agriculture can benefit when indigenous technical knowledge of farmers or ITK is reclaimed and integrated with modern farming practices. ITK is derived from local culture traditions and long-term human interaction with the environment. It needs both documentation and conscious promotion for a more sustainability oriented perspective in agriculture. This book aims to document ITK in agriculture by detailing rituals and practices followed in the cultivation of the main crops in the North Malabar region of Kerala.


ISBN: 9788175963481 175pp PB ₹ 395.00

This concise booklet is intended to create public awareness about aspects of pesticide use in India. Ignorance about pesticides in India is widespread and administrative and legislative lacunae have aggravated the situation. This booklet is a small step in the long and arduous process of helping to make our society and environment pesticide free.

Contents: Introduction; 1. Physical and Cultural Methods of Pest Control; 2. Biological Control Agents; 3. Plant-based Products for Pest Control; Conclusion; Appendix - 1; References

ISBN: 9788175963634 72pp PB ₹ 295.00

Although similar geomorphic processes take place in other regions in the tropics these processes operate at different rates and with varying intensities. Tropical geomorphology therefore provides many new discoveries regarding geomorphic processes. This textbook describes both the humid and arid tropics. It provides thoroughly up-to-date concepts and relevant case studies and emphasises the importance of geomorphology in the management and sustainable development of the tropical environment including climate change scenarios. The text is supported by a large number of illustrations including satellite images. Student exercises accompany each chapter.

Tropical Geomorphology is an ideal textbook for any course on tropical geomorphology or the tropical environment and is also invaluable as a reference text for researchers and environmental managers in the tropics.


ISBN: 9781107696990 400pp PB ₹ 695.00

100 b/w illus. 10 colour illus. 35 tables 100 exercises

This book discusses livestock rearing in India in relation to changes in the economy and policies of the government. The issues range from traditional practices in animal rearing effect of colonial and post-colonial practices to the current policies. It also discusses methods to promote sustainable biodiversity and alternative systems of veterinary care.

Contents: Preface; Chapter 1. The Beginning; Chapter 2. Patterns of Livestock Rearing; Chapter 3. Traditional practices in animal rearing; Chapter 4. Emerging trends in Livestock Rearing; Chapter 5. It must not end : Towards an alternative Policy; Chapter 6. Reorienting Ourselves; Chapter 7. Framework for an alternate Policy References Index List of Figures List of Tables List of Boxes

ISBN: 9788175961838 138pp HB ₹ 895.00
The link between business production commerce and environmental imperatives is becoming more and more obvious. Industry the world over is under pressure like never before from an unprecedented set of environmental laws. But the fact is that only a few crusaders have managed to influence policy makers and opinion makers to devise the “command and control regime”. It became increasingly clear during the latter part of the twentieth century that current development models would not help create an appropriate milieu for progress that would maintain a desirable environment and ensure sustainable development. To bridge this gap a proactive movement emerged in governing systems including industry and community. This has entailed a paradigm shift in approach popularly known as PEM i.e. Preventive Environmental Management. Implicit in this paradigm is the twining of economic and environmental benefits. This book highlights the need for incorporating PEM approaches characterized by community action at all levels of implementation. At the company level PEM means adopting a holistic approach that includes diagnosing processes and systems for pollution hot-spots interventions to reduce wastes at source improving product quality and yield enhancing waste treatment and value addition and integrating economic and environmental concerns of the stakeholders. What the book attempts is an interpretation of the present status of India’s environment with special reference to municipal and industrial operations. It also discusses the significance of appropriate tools and techniques that enable transition across the continuum of production consumption and environmental protection as well as the preparedness of communities to monitor improved environmental quality. An expansive framework for resolving some prevailing dilemmas has also been proposed in this book.


Crustal Evolution and Metallogeny in India
Sanjib Chandra Sarkar & Anupendu Gupta

Crustal Evolution means the changes that the Earth’s crust has gone through the geologic past as the effects of changes in the mantle-crust system, the atmosphere, the hydrosphere and the biosphere. Metallogeny is the genesis of metallic mineral deposits. Both the terms are used in the book in their conventional sense, but in the context of India.

Contents: List of Figures | List of Tables | List of Plates | Preface | Chapter 1: Southern India | Chapter 2: Central India | Chapter 3: Eastern Ghat Mobile Belt | Chapter 4: Eastern India | Chapter 5: North-eastern India | Chapter 6: Western India | Chapter 7: The Himalaya: An outline | Chapter 8: Crustal Evolution and Metallogeny in India: A Brief Review in the Context of World-scenario | References | Index | Plate Section

ISBN: 9781107007154     HB  ₹ 1950.00

Perils of Pesticides
Mukund Joshi

This concise book is intended to create public awareness about aspects of pesticide use in India. Ignorance about pesticides in India is widespread and administrative and legislative lacunae have aggravated the situation. This book is a small step in the long arduous process of helping to make our society and environment pesticide free.


ISBN: 9788175962637     PB  ₹ 195.00

Environmental Valuation in South Asia
A. K. Enamul Haque, M. N. Murty & Priya Shyamsundar (Eds.)

This book is about understanding the value of environmental services in South Asia. It provides an overview of different environmental problems in South Asia and examines how economic valuation techniques can be used to assess these problems. It brings together multiple case studies on valuation undertaken by economists and environmental scientists from Bangladesh, India, Pakistan, Nepal and Sri Lanka under the aegis of the South Asian Network for Development and Environmental Economics (SANDEE).


ISBN: 9788175963139     656pp     HB  ₹ 995.00
Gravity Currents
In the Environment and the Laboratory
John E. Simpson

This 1997 book comprehensively describes all aspects of gravity flow, a physical process in the environment that is covered by many different disciplines including meteorology, oceanography, the earth sciences, and many industrial processes. No other book covers a similar range of information. This second edition includes much new material and is like the first edition the hardback has been very well received. Gravity currents are described with a variety of laboratory experiments many from the author's own work. Now in paperback, Gravity Currents is a valuable supplementary textbook for undergraduates and a reference work for research workers. The general reader will also find much of interest since the physics of the flows involved is clearly described without advanced mathematics by numerous photographs and illustrations.


ISBN: 9781107007147 500pp HB ₹ 895.00

Petroleum Pipelines
A Handbook for Onshore Oil and Gas Pipelines
Sanjoy Chanda

Petroleum pipelines ensure the sustained availability of petroleum products all across the country. Pipelines transport petroleum products in a safe and efficient manner from refineries to demand areas. They also transport crude oil from import terminals as well as domestic sources to the inland refineries. India, being a developing nation, has a large network of petroleum pipelines. Economic growth and expansion of infrastructure in this country offer opportunities to better utilize the existing pipeline network. The construction of new pipelines extends this network further.

Contents: List of tables; List of figures; Preface; Chapter 1: Introduction: Some Basic Facts about Pipelines; Chapter 2: Pipeline Design and Engineering; Chapter 3: Pipeline Construction; Chapter 4: Pre-commissioning and Commissioning of Pipelines; Chapter 5: Operation and Maintenance of Cross-country Pipelines; Chapter 6: Pipeline Corrosion and Its Mitigation; Index

ISBN: 9789382264583 238pp HB ₹ 895.00

The Dating Game
One Man’s Search for the Age of the Earth
Cherry Lewis

How old is the Earth? At the end of the nineteenth century, geologists and biologists were looking for a clock that would provide an answer to this the greatest Time question of all. The Dating Game tells the story of one man’s vision of developing a geological timescale that would finally lead to an accurate date for the Age of the Earth. Despite scientific opposition, financial hardship and personal tragedy, Arthur Holmes, greatest geologist of the twentieth century fought for fifty years to convince the establishment of an Earth of great antiquity; a fight that eventually transformed the moribund art of geology into a dynamic science. Cherry Lewis engaging writing brings Holmes back to life and skillfully weaves his adventures, loves and losses around the early history and science of dating the Earth and the discovery of radioactivity - the clock that tells geological time.


ISBN: 9780521790512 HB ₹ 795.00
The Weather Observer’s Handbook provides a comprehensive practical and independent guide to all aspects of making weather observations. Automatic weather stations today form the mainstay of both amateur and professional weather observing networks around the world and yet “prior to this book” there existed no independent guide to their selection and use. Traditional and modern weather instruments are covered including how best to choose and to site a weather station how to get the best out of your equipment how to store and analyse your records and how to share your observations with other people and across the Internet. From amateur observers looking for help in choosing their first weather instruments on a tight budget to professional observers looking for a comprehensive and up-to-date guide covering World Meteorological Organization recommendations on observing methods and practices all will welcome this handbook.


ISBN: 9781107622012 PB ₹ 895.00

Tropical Food Crops
2/E (CLPE)
M. J. T. Norman, C. J. Pearson, P. G. E. Searle

In tropical developing countries farmers tend to grow a wide range of crops in a small area for subsistence or sale. To make full use of often limited resources a good understanding of how environmental conditions affect the characteristics and performance of these crops is essential. This book considers the response of tropical food crops to environmental factors such as climate, soil and farming system. Three types of crop are considered; cereals, legumes and non-cereal energy crops, with individual chapters on the four most important crops in each group. This material is set in context by introductory chapters on tropical farming systems, tropical climates and tropical soils. This updated edition retains the successful formula of the first edition, and will serve the needs of advanced students of tropical agriculture, as well as professionals engaged in research and extension work in tropical crop production.


ISBN: 9780521586894 442pp PB ₹ 325.00
The Skeptical Environmentalist
Measuring the Real State of the World
Bjørn Lomborg

The Skeptical Environmentalist challenges widely held beliefs that the environmental situation is getting worse and worse. The author, himself a former member of Greenpeace, is critical of the way in which many environmental organisations make selective and misleading use of the scientific evidence. Using the best available statistical information from internationally recognised research institutes, Bjørn Lomborg systematically examines a range of major environmental problems that feature prominently in headline news across the world. His arguments are presented in non-technical, accessible language and are carefully backed up by over 2500 footnotes allowing readers to check sources for themselves. Concluding that there are more reasons for optimism than pessimism, Bjørn Lomborg stresses the need for clear-headed prioritisation of resources to tackle real, not imagined problems. The Skeptical Environmentalist offers readers a non-partisan stocktaking exercise that serves as a useful corrective to the more alarmist accounts favoured by campaign groups and the media.


ISBN: 9780521671521 540pp PB 795.00

Environmental Sciences

Principles of Radiometric Dating
K Gopalan

This book covers essential concepts of radiogenic isotope geochronometry in a lucid manner. It discusses principles and insights behind radiometric dating tools for better understanding of radiogenic isotope concepts. The text starts with discussion on nuclear transformations and nucleosynthesis and move forward to elaboratenatural radioactivity and geochronometry. The book covers evolutionary history of meteorites and the earth by examining relevant isotopic systems that illuminate temporal aspects of evolution. Detailed discussion on topics including error analysis and mass spectrometry is presented in lucid manner for the benefit of readers. Illustrations and case studies have been carefully chosen to highlight the discoveries and recent research work, carried out in the field of radiogenic isotope geochronometry. Considerable effort has been made to unify essential information in single volume for better understanding of the concepts.


ISBN: 350pp (T) 350pp (T) HB 695 (T)
CHEMISTRY

Modern Methods of Organic Synthesis
Fourth Edition
W. Carruthers & Iain Coldham

The fourth edition of this well-known textbook discusses the key methods used in organic synthesis, showing the value and scope of these methods and how they are used in the synthesis of complex molecules. All the text from the third edition has been revised to produce a modern account of synthetic methods and an up-to-date description of recent advancements in synthetic chemistry. The textbook maintains a traditional and logical approach in detailing carbon-carbon bond formations, followed by a new chapter on the functionalization of alkenes and concluding with oxidation and reduction reactions. Reference style has been improved to include footnotes on each page, allowing easy and rapid access to the primary literature. In addition, a selection of problems has been added at the end of each chapter, with answers at the end of the book.


ISBN: 9780521682138  505pp PB  ₹ 495.00

Atomic and Molecular Spectroscopy
Basic Concepts and Applications
Rita Kakkar

Spectroscopy is the study of electromagnetic radiation and its interaction with solid, liquid, gas and plasma. It is one of the widely used analytical techniques to study the structure of atoms and molecules. The technique is also employed to obtain information about atoms and molecules as a result of their distinctive spectra. The fast spreading field of spectroscopic applications has made noteworthy influence on many disciplines, including energy research, chemical processing, environmental protection and medicine.

This book aims to introduce students to the topic of spectroscopy. The author has avoided the mathematical aspects of the subject as far as possible; they appear in the text only when inevitable. The mathematical examples have been kept at a level that does not require in-depth knowledge of mathematics. Including the topics such as time-dependent perturbation theory, laser action and applications of Group Theory in interpretation of spectra, the book offers a detailed coverage of the basic concepts and applications of spectroscopy.

Contents: List of figures; List of tables; List of abbreviations; Preface; Acknowledgements; 1. Fundamentals of spectroscopy; 2. Theoretical principles; 3. Atomic spectroscopy; 4. Pure rotational spectroscopy; 5. Vibrational spectroscopy of diatomics; 6. Vibrational spectroscopy of polyatomic molecules; 7. The raman effect; 8. Electronic spectroscopy of diatomic molecules; 9. Electronic spectroscopy of polyatomic molecules; Appendix I; Appendix II; Bibliography; Index

ISBN: 9781107063884  438pp HB  ₹ 895.00

Principles of Quantum Chemistry
Ram Yatan Prasad & Pranita Prasad

Principles of Quantum Chemistry is a textbook that conforms to the postgraduate syllabus of chemistry at major Indian universities. Written in a lucid manner, it deals with the fundamental concepts of quantum chemistry and provides rigorous and thorough mathematical techniques. The text also answers frequently asked questions and highlights the essential mathematical formulae and important conclusions. It will be of great use to students of theoretical chemistry, molecular physics, quantum chemistry and chemical physics. It will also appeal to researchers to calculate various properties of atoms and molecules.

Key features
- Provides comprehensive discussion on mathematical techniques and quantum mechanical operators to solve problems
- Includes updated information on computational techniques
- Elucidates a structured approach for equations and mathematical derivations
- Large number of solved examples and numerical problems for better understanding
- Model question papers for preparation of exams


ISBN: 9789382993735  804pp PB  ₹ 795.00

Climbing the Limitless Ladder
A Life in Chemistry
C. N. R. Rao

This invaluable book is an autobiographical account of doing scientific research in India. It provides an insight to the perseverance of a scientist from a developing country. His relentless pursuit of excellence in chemistry for more than half a century is a remarkable source of inspiration to young scientists facing modern-day challenges.


ISBN: 9788175969124  232pp PB  ₹ 695.00
An Introduction to Theoretical Chemistry
Jack Simons

In this unique textbook Jack Simons goes back to basics and focuses on the foundations that lie at the heart of modern day theoretical chemistry. Emphasis is on the concepts tools and equations that govern the three main theoretical chemistry sub-disciplines: electronic structure statistical mechanics and reaction dynamics. Part I provides the foundations of quantum mechanics and molecular spectroscopy as applied to chemistry today. This section can be used either as stand-alone material in a junior level physical chemistry class or to provide the reader with the tools and background needed to cover the second part of the book. Part II starts with a general overview of theoretical chemistry and then gives a very accessible introduction to each of the three main sub-disciplines in the subject. Highly illustrated with numerous exercises and worked solutions this book provides a concise up-to-date treatise on the underpinnings of modern theoretical chemistry.


ISBN: 9780521670463 PB ₹ 495.00

Probability for Finance
Ekkehard Kopp, Jan Malczak & Tomasz Zastawniak

Students and instructors alike will benefit from this rigorous unfussy text which keeps a clear focus on the basic probabilistic concepts required for an understanding of financial market models including independence and conditioning. Assuming only some calculus and linear algebra the text develops key results of measure and integration which are applied to probability spaces and random variables culminating in central limit theory. Consequently it provides essential prerequisites to graduate-level study of modern finance and more generally to the study of stochastic processes. Results are proved carefully and the key concepts are motivated by concrete examples drawn from financial market models. Students can test their understanding through the large number of exercises and worked examples that are integral to the text.

ISBN: 978382264743 600pp PB ₹ 3950.00
Policy-makers often come across the question of how progress and investment in science, technology and innovation (STI) can increase employment and upgrade skills and knowledge base in India. The paradox is that while STI has the potential to invent new avenues of economic growth sometimes even with increasing returns, the general forces unleashed by STI displace labour and automate a large part of human skills and knowledge. Such a paradox has a great impact on a country like India which is struggling with the ever-increasing pressure of labour force, unemployment and economic inequality. It is to be noted that the 12th Five Year Plan has made inclusive growth concomitant of employment generation and skill development a top priority.

Contents: List of Figures; List of Tables; Acknowledgments; Abbreviations; Foreword; Acknowledgements; Summary; S&T Human Resource; S&T and Industry; S&T Outputs; Rural India: S&T for Skills and Employment; References; Contributors; Index

ISBN: 9789384463045 600pp PB ₹ 4000.00

Among the economic measures specified by the World Health Organization, Framework Convention on Tobacco Control, taxation is considered the most effective method to reduce tobacco consumption. However, this fiscal policy tool has not been effective in India where, unlike the west, bidi smoking and chewing tobacco predominates cigarette smoking. India's current tax regime does not reflect this consumption pattern. More than three-fourth of the existing tobacco tax revenue comes from cigarettes. Taxes on bidi have been minimal due to the notion that they are regressive and adversely impact the poor, and till recently chewing tobacco was not taxed.

Contents: List of Figures; List of Tables; Acknowledgments; Abbreviations; Chapter 1: Introduction; Chapter 2: Tobacco Consumption Patterns in India; Chapter 3: Tobacco Tax Structure in India; Chapter 4: Changing Tobacco Tax Structure and its Implications for Tobacco Consumption; Chapter 5: Conclusions and Policy Implications; Annexure I: Tobacco Taxation and Revenue Matrix; Annexure II: Price Elasticity Estimates by Major States, 2011–12; Annexure III: State Descriptive Statistics, 2011–12; Annexure IV: State Tobacco Tax Simulations, 2011–12; References; Index

ISBN: 9781107439924 196pp PB ₹ 650.00

The Langlands Program was conceived initially as a bridge between Number Theory and Automorphic Representations, and has now expanded into such areas as Geometry and Quantum Field Theory, tying together seemingly unrelated disciplines into a web of tantalizing conjectures. A new chapter to this grand project is provided in this book. It develops the geometric Langlands Correspondence for Loop Groups, a new approach, from a unique perspective offered by affine Kac-Moody algebras. The theory offers fresh insights into the world of Langlands dualities, with many applications to Representation Theory of Infinite-dimensional Algebras, and Quantum Field Theory. This accessible text builds the theory from scratch, with all necessary concepts defined and the essential results proved along the way. Based on courses taught at Berkeley, the book provides many open problems which could form the basis for future research, and is accessible to advanced undergraduate students and beginning graduate students.


ISBN: 9780521168892 PB ₹ 650.00

Risk control and derivative pricing have become of major concern to financial institutions, and there is a real need for adequate statistical tools to measure and anticipate the amplitude of the potential moves of the financial markets. Summarising recent theoretical developments in the field, this second edition has been substantially expanded. Additional chapters now cover stochastic processes, Monte-Carlo methods, Black-Scholes theory, the theory of the yield curve, and Minority Game. There are discussions on aspects of data analysis, financial products, non-linear correlations, and herding, feedback and agent based models. This book has become a classic reference for graduate students and researchers working in econophysics and mathematical finance, and for quantitative analysts working on risk management, derivative pricing and quantitative trading strategies.

Water in the Coming Decades
Policy and Governance
Issues in India
Kamta Prasad

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Knowledge Systems and Natural Resources
Management Policy and Institutions in Nepal
Hemant R Ojha, Netra P Timsina, Ram B Chhetri & Krishna P Paudel (Eds.)

Knowledge Systems and Natural Resources is a unique collection of case studies from Nepal. It provides rich and incisive insights into critical social processes and deliberative governance. The book challenges the dichotomy between traditional and scientific knowledge. It proposes to differentiate among systems of knowledge on the basis of political standing of social actors engaged in natural resource governance. It further proposes that change in governance hinges on how the diverse systems of knowledge come into deliberative interface and to what extent the unequal distribution of power and knowledge resources in society constrain the process of deliberation. This book will be of great interest to development policy-makers governance specialists researchers academics development advisors social activists and students of social and political sciences and natural resource management.

agriculture technology development * Scientists' perspectives 3 Contested Knowledge and Reconciliation in Nepal's Community Forestry: A Case of Forest Inventory Policy 4 From Grassroots to Policy Deliberation: The Case of Community Forest Users' Federation in Nepal 5 From Isolation to Interaction: Increasing Knowledge Interface in Chhattis Mauja Irrigation system in Nepal 6 Action Research Experience on Democratising Knowledge in Community Forestry in Nepal 7 Culturally Embedded Knowledge in Irrigation: People's Ways of Thriving in a Himalayan Village 8 Deliberative Knowledge Interface: Lessons and Policy Implications – Findings – Conclusion - Way Ahead About the contributors

Harry Collins and Trevor Pinch liken science to the Golem, a creature from Jewish mythology, powerful yet potentially dangerous, a gentle, helpful creature that may yet run amok at any moment. Through a series of intriguing case studies the authors debunk the traditional view that science is the straightforward result of competent theorisation, observation and experimentation. The very well-received first edition generated much debate, reflected in a substantial new Afterword in this second edition, which seeks to place the book in what have become known as 'the science wars'. Second edition of a very well received title Original edition generated much controversy, debate and publicity; addressed in this new edition Demystifies science and is highly readable on complex subjects

Contents: Introduction: the Golem; 1. Edible knowledge: the chemical transfer of memory; 2. Two experiments that 'proved' the theory of relativity; 3. The sun in a test tube: the story of cold fusion; 4. The germs of dissent: Louis Pasteur and the origins of life; 5. A new window on the universe: the non-detection of gravitational radiation; 6. The sex life of the whiptail lizard; 7. Set the controls for the heart of the sun: the strange story of the missing solar neutrinos; Conclusion: putting the Golem to work; Afterword; References and further reading; Index.

The Indian Ocean Tsunami
The Global Response to a Natural Disaster
Pradyumna P. Karan, Shanmugam P. Subbiah

On December 26, 2004 a massive tsunami triggered by an underwater earthquake struck the coasts of Thailand, Indonesia, Sri Lanka and certain other countries along the Indian Ocean. With casualties as far away as Africa the aftermath was overwhelming: ships could be spotted miles inland; cars floated in the ocean; legions of the unidentified dead (an estimated 225 000) were buried in mass graves; relief organizations struggled to reach rural areas and provide adequate aid for survivors.


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