PHI Learning’s Eastern Economy Editions (3Es) consist of outstanding works of Indian authors and unabridged reprints of established titles widely used by universities. These lower priced editions are published for the benefit of students.
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This book provides the fundamental concepts of system design using microprocessors in the field of agriculture instrumentation. It begins with an introduction to the field of agriculture and application of instrumentation in agriculture, and the book then covers the transducers specific to the agricultural field. The binary number system and arithmetic are covered as the basic building block of digital circuits and computer organization. The microprocessor basics and Intel 8085 hardware and software have been discussed in detail. The book describes microprocessor peripheral interfacing and its support chips such as Intel 8225, Intel 8253 and Intel 8279 along with their applications. It discusses analog to digital and digital to analog interface, CRT terminal interface and printer interface. In addition, the book includes case studies on various microprocessor applications in agriculture, such as microprocessor-based system design for grain moisture, safe grain storage, soil nutrient estimation and drip irrigation. Finally, the book ends with an advanced and futuristic topic on precision agriculture to give an exposure to students about future developments in the agricultural system.

**KEY FEATURES**

- From concepts to design, the book follows a step-by-step approach.
- Gives a large number of figures for easy understanding of theory.
- Includes a good number of examples and end-of-chapter exercises both in the hardware and software sections.
- Presents a number of case studies on the design of microprocessor-based agri-instrumentation systems.
- Offers exercises on the case studies which can be used for further development of the concepts.

The book is primarily intended for the undergraduate and postgraduate students of agricultural engineering for their courses on agri instrumentation and microprocessor applications in agriculture.


Latest Print 2014 / 572 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4826-4 / ₹ 450.00 / (e-book also available)

Irrigation and Water Power Engineering

DAS & SAIKIA
Irrigation and Water Power Engineering
MADAN MOHAN DAS, formerly Professor, Department of Civil Engineering, Assam Engineering College, Guwahati.
MIMI DAS SAIKIA, Professor, Civil Engineering Department, Assam Down Town University, Guwahati.

Designed primarily as a textbook for the undergraduate students of civil and agricultural engineering, this comprehensive and well-written text covers irrigation system and hydroelectric power development in lucid language.

The text is organized in two parts. Part I (Irrigation Engineering) deals with the methods of water distribution to crops, water requirement of crops, soil-water relationship, well irrigation and hydraulics of well, canal irrigation and different theories of irrigation canal design. Part II (Water Power Engineering) offers the procedures of harnessing the hydropotential of river valleys to produce electricity. It also discusses different types of dams, surge tanks, turbines, draft tubes, power houses and their components. The text emphasizes on the solutions of unsteady equations of surge tank and pipe carrying water to power house under water hammer situation. It also includes computer programs for the numerical solutions of hyperbolic partial differential equations.

KEY FEATURES

- Provides worked out examples and problems (in SI units).
- Presents all possible methods of design including Ranga-Raju-Misri’s new approach of canal design.
- Gives numerous illustrations to reinforce the understanding of the subject.

Besides undergraduate students, this book will also be of immense use to the postgraduate students of water resources engineering.


Latest Print 2014 / 436 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-3587-5 / ₹ 395.00 / (e-book also available)

Soil and Water Conservation Engineering

GHANSHYAM DAS
Hydrology and Soil Conservation Engineering including Watershed Management, 2nd ed.
GHANSHYAM DAS, formerly Emeritus Fellow (AICTE) and Professor in Soil and Water Conservation Engineering, G.B. Pant University of Agriculture and Technology, Pantnagar.

Streamlined to facilitate student understanding, this second edition, containing the latest techniques and methodologies and some new problems, continues to provide a comprehensive treatment of hydrology of watersheds, soil erosion problems, design and installation of soil conservation practices and structures, hydrologic and sediment yield models, watershed management and water harvesting. It also deals with the special requirements of management of agricultural and forested watersheds.

This book is designed for undergraduate students of agricultural engineering for courses in hydrology, and soil and water conservation engineering. It will also be of considerable value to students of agriculture, soil science, forestry, and civil engineering.

FEATURES

- Emphasises fundamentals using numerous illustrations to help students visualise different phenomena
- Offers lucid presentation of field practices
- Presents the analysis and design of basic hydraulic structures
- Devotes an entire chapter to watershed management
- Provides numerous solved design problems and exercise problems to develop a clear understanding of the theory
- Gives theoretical questions, and objective type questions with answers to test the students’ understanding.


Latest Print 2014 / 552 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3586-8 / ₹ 425.00 / (e-book also available)
BIOMEDICAL ENGINEERING

Biomedical Instrumentation

ANANDANATARAJAN

Biomedical Instrumentation and Measurements

R. ANANDANATARAJAN, Professor and Head, Department of Electronics and Instrumentation Engineering, Pondicherry Engineering College, Puducherry.

Designed as a text for the undergraduate students of instrumentation, electrical, electronics and biomedical engineering, it covers the entire range of instruments and their measurement methods used in the medical field. The functions of the biomedical instruments and measurement methods are presented keeping in mind those students who have minimum required knowledge of human physiology.

The purpose of this book is to review the principles of biomedical instrumentation and measurements employed in the hospital industry. Primary emphasis is laid on the method rather than micro level mechanism. This book serves two purposes: One is to explain the mechanism and functional details of human body, and the other is to explain how the biological signals of human body can be acquired and used in a successful manner.

KEY FEATURES
• More than 180 illustrations throughout the book.
• Short questions with answers at the end of each chapter.
• Chapter-end exercises to reinforce the understanding of the subject.

Contents:

Latest Print 2013 / 304 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-0653-0 / ₹ 295.00 / (e-book also available)

CROMWELL, WEIBELL & PFEIFFER

Biomedical Instrumentation and Measurements, 2nd ed.

LESLIE CROMWELL, California State University, Los Angeles, California.
FRED J. WEIBELL, Veterans Administration, Biomedical Engineering and Computing Centre, Sepulveda, California.
ERIC A. PFEIFFER, Wells Fargo Alarm Services, Engineering Centre, Hawthorne, California.

This well-illustrated book provides a broad and highly practical introduction to all aspects of biomedical instrumentation from design and use to maintenance.

Readers having an elementary technical background in electronics or engineering and a casual familiarity with physiology should find this book quite beneficial. Besides, students of life sciences and other allied fields with some knowledge of instrumentation should also find this text useful. Furthermore, it should prove to be an excellent reference book for medical/paramedical personnel.


Latest Print 2014 / 528 pp. / 15.3 × 22.9 cm
ISBN-978-81-203-0653-0 / ₹ 275.00

JOG

Electronics in Medicine and Biomedical Instrumentation, 2nd ed.

NANDINI K. JOG an Adjunct Professor, Department of Electronics Engineering, Mukesh Patel School of Technology Management and Engineering, NMIMS University, Mumbai.

Medical electronics is using vast and varied applications in numerous spheres of human endeavour—ranging from communication, biomedical engineering to recreational activities. This book in its second edition continues to give a detailed insight into the basics of human physiology. It also educates the readers about the role of electronics in medicine and the various state-of-the-art equipments being used in hospitals around the world.

The text presents the reader with a deep understanding of the human body, the functions of its various organs, and then moves on to the biomedical instruments used to decipher with greater precision the signals in relation to the body’s state of well-being. The book incorporates the latest research and developments in the field of biomedical instrumentation. Numerous diagrams and photographs of medical instruments make the book visually appealing and interesting.

Primarily intended as a text for the students of Electronics and Instrumentation Engineering and Biomedical Engineering, the book would also be of immense interest to medical practitioners.

NEW TO THIS EDITION
• Magnetoencephalography (MEG) and features of Mediscope software used for medical imaging
• Topics on optical fiber transducers, and fiber optic microphones used in MRI scanning
• Discusses in detail the medical instruments like colorimeter, spectro-photometer and flame photometry and auto analyzers for the study of toxic levels in the body
• Includes a detailed description of pacemakers and defibrillators, and tests like Phonocardiography, Vector Cardiography, Nuclear stress test, MRI stress test
• Addition of the procedure of dialysis, hemodialysis and peritoneal dialysis


Latest Print 2013 / 208 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4724-3 / ₹ 250.00 / (e-book also available)

Medical Image Processing

SINHA & PATEL
Medical Image Processing: Concepts and Applications
G.R. SINHA, Professor in Electronics and Telecommunication and Associate Director, Faculty of Engineering and Technology, Shri Shankaracharya Group of Institutions, Shri Shankaracharya Technical Campus, Bhilai, Chhattisgarh. He is Dean of Faculty and Executive Council Member, Swami Vivekanand Technical University, Bhilai, Chhattisgarh.
BHAGWATI CHARAN PATEL, Associate Professor in Information Technology, Faculty of Engineering and Technology, Shri Shankaracharya Group of Institutions, Shri Shankaracharya Technical Campus, Bhilai, Chhattisgarh.

Medical Image Processing: Concepts and Applications presents an overview of image processing for various applications in the field of medical science. Inclusion of several topics like noise reduction filters, feature extraction, image restoration, segmentation, soft computing techniques and context-based medical image retrieval, etc. makes this book a single-source information meeting the requirements of the readers. Besides, the coverage of digital image processing, human visual perception and CAD system to be used in automated diagnosis system, medical imaging modalities, various application areas of medical field, detection and classification of various disease, etc. is highly emphasised in the book.

The book, divided into eight chapters, presents the topics in a clear, simple, practical and cogent fashion that provides the students with the insight into theory as well as applications to the practical problems. The research orientation of the book greatly supports the concepts of image processing to be applied for segmentation, classification and detection of affected areas in X-ray, MRI and mammographic and all other medical images. Throughout the book, an attempt has been made to address the challenges faced by radiologists, physicians and doctors in scanning, interpretation and diagnosis process. The book uses an abundance of colour images to impart a high level of comprehension of concepts and
helps in mastering the process of medical image processing. Special attention is made on the review of algorithms or methods of medical image formation, processing and analysis, medical imaging applications, and emerging medical imaging modality. 

This is purely a text dedicated for the undergraduate and postgraduate students of biomedical engineering. The book is also of immense use to the students of computer science engineering and IT who offer a course on digital image processing.

KEY POINTS
• Chapter-end review questions test the students’ knowledge of the fundamental concepts.
• Course outcomes help the students in capturing the key points.
• Several images and information regarding morphological operations given in appendices help in getting additional knowledge in the field of medical image processing.

Contents:

Latest Print 2014 / 268 pp. / 17.8 × 23.5 cm

Chemical Engineering Thermodynamics

AHUJA

Chemical Engineering Thermodynamics

PRADEEP AHUJA, Associate Professor, Department of Chemical Engineering and Technology, Institute of Technology, Banaras Hindu University, Varanasi.

This book offers a full account of thermodynamic systems in chemical engineering. It provides a solid understanding of the basic concepts of the laws of thermodynamics as well as their applications with a thorough discussion of phase and chemical reaction equilibria.

At the outset the text explains the various key terms of thermodynamics with suitable examples and then thoroughly deals with the virial and cubic equations of state by showing the thoroughness deals with the virial and cubic equations of state by showing the

The text further discusses the concepts of exergy, temperature (pressure, molar volume and temperature) relation of fluids. It elaborates on the first and second laws of thermodynamics and their applications with the help of numerous engineering examples.

The text also includes detailed discussions on residual and excess properties of mixtures, various activity coefficient models, local composition models, and group contribution methods. In addition, the text focuses on vapour-liquid and other phase equilibrium calculations, and analyzes chemical reaction equilibria and adiabatic reaction temperature for systems with complete and incomplete conversion of reactants.

KEY FEATURES
• Includes a large number of fully worked-out examples to help students master the concepts discussed.
• Provides well-graded problems with answers at the end of each chapter to test and foster students' conceptual understanding of the subject. The total number of solved examples and end-chapter exercises in the book are over 600.
• Contains chapter summaries that review the major concepts covered.

The book is primarily designed for the undergraduate students of chemical engineering and its related disciplines such as petroleum engineering and polymer engineering. It can also be useful to professionals.

The Solution Manual containing the complete worked-out solutions to chapter-end exercises and problems is available for instructors.


HALDER

Introduction to Chemical Engineering Thermodynamics, 2nd ed.

GOPINATH HALDER, Associate Professor, Department of Chemical Engineering, National Institute of Technology, Durgapur, West Bengal.

This book, now in its second edition, continues to provide a comprehensive introduction to the principles of chemical engineering thermodynamics and also introduces the student to the application of principles to various practical areas.

The book emphasizes the role of the fundamental principles of thermodynamics in the derivation of significant relationships between the various thermodynamic properties. The initial chapter provides an overview of the basic concepts and processes, and discusses the important units and dimensions involved. The ensuing chapters, in a logical presentation, thoroughly cover the first and second laws of thermodynamics, the heat effects, the thermodynamic properties and their relations, refrigeration and liquefaction processes, and the equilibria between phases and in chemical reactions. The book is suitably illustrated with a large number of visuals.

In the second edition, new sections on Quasi-Static Process and Entropy Change in Reversible and Irreversible Processes are included. Besides, new Solved Model Question Paper and several new Multiple Choice Questions are added that help develop the students' ability and confidence in the application of the underlying concepts.

Primarily intended for the undergraduate students of chemical engineering and other related engineering disciplines such as polymer, petroleum and pharmaceutical engineering, the book will also be useful for the postgraduate students of the subject as well as professionals in the relevant fields.

Latest Print 2014 / 684 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4897-4 / ₹ 495.00 / (e-book also available)

KYLE

Chemical and Process Thermodynamics, 3rd ed. (with CD-ROM)
B.G. KYLE, Emeritus Professor of Chemical Engineering, Kansas State University.
This is an example-rich guide to chemical engineering thermodynamics that focuses on current techniques, new applications, and today’s revolutionary computer tools. The sequentially organized book helps in discovering both the “how” and “why” of chemical engineering thermodynamics, and helps to improve the problem-solving effectiveness with an extensive collection of sophisticated PC software.

This brand new third edition reflects newly-developed techniques and applications and includes a thorough treatment of complex chemical equilibria as well as philosophy and practice of modeling thermodynamic systems.

CD-ROM: The accompanying CD-ROM contains nine executable programs, three spreadsheets for pro-fessional calculations, POLYMATH numerical analysis software, and EQUATIONS OF STATE software for thermodynamic process visualization on 3D PVT diagrams.


Latest Print 2010 / 788 pp. / 17.8 × 23.5 cm

NARAYANAN

Textbook of Chemical Engineering Thermodynamics, A
K.V. NARAYANAN, Professor and Head, Department of Chemical Engineering, Government Engineering College, Thrissur.

This book on thermodynamics deals exclusively with the theory and applications relevant to chemical processes. It is intended as a textbook for undergraduate courses in chemical engineering.

More than 200 worked-out examples and 400 end-of-chapter problems are provided to help the student gain a better insight into the theory. The SI units are used throughout. A number of objective type questions are included in an Appendix which will be of immense help to students in preparing for the competitive examinations.

The book will also be a useful text for students pursuing courses in chemical engineering related branches such as polymer engineering, petroleum engineering, and safety and environmental engineering.


Latest Print 2013 / 520 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-1732-1 / ₹ 375.00 / (e-book also available)

Chemical Process Calculations

HIMMELBLAU & RIGGS

Basic Principles and Calculations in Chemical Engineering, 8th ed. (with CD-ROM)
DAVID M. HIMMELBLAU was the Paul D. and Betty Robertson Meek and American Petrofina Foundation Centennial Professor Emeritus in Chemical Engineering at University of Texas.
JAMES B. RIGGS, former Professor, Texas Tech University.
The Eighth Edition of this book goes far beyond traditional introductory chemical engineering topics, presenting applications that reflect the full scope of contemporary chemical, petroleum, and environmental engineering. This edition has been extensively updated and reorganized to cover today’s principles and calculations more efficiently, and to present far more coverage of bioengineering, nanoengineering, and green engineering.

Offering a strong foundation of skills and knowledge for successful study and practice, this book guides students through formulating and solving material and energy balance problems, as well as describing gases, liquids, and vapors. Throughout, the authors introduce efficient, consistent, student-friendly methods for solving problems, analyzing data, and gaining a conceptual, application-based understanding of modern chemical engineering processes. This edition’s enhancements include many new problems, examples, and homework assignments.
COVERAGE INCLUDES
• Modular chapters designed to support introductory chemical engineering courses of any length
• Thorough introductions to unit conversions, basis selection, and process measurements
• Consistent, sound strategies for solving material and energy balance problems
• Clear introductions to key concepts ranging from stoichiometry to enthalpy
• Behavior of gases, liquids, and solids: ideal/real gases, single component two-phase systems, gas-liquid systems, and more
• Self-assessment questions to help readers identify areas they don’t fully understand
• Thought-provoking homework problem in every chapter
• New biotech and bioengineering problems throughout
• New examples and homework on nanotechnology, environmental engineering, and green engineering
• Extensive tables, charts, and glossaries in each chapter
• Reference appendices presenting atomic weights and numbers, Pitzer Z factors, heats of formation and combustion, and more

Practical, readable, and exceptionally easy to use, this book is the definitive chemical engineering introduction for students, license candidates, practicing engineers, and scientists.

The CD-ROM in the book includes
• The latest Polymath trial software for solving linear, nonlinear, and differential equations and regression problems
• Point-and-click physical property database containing 700+ compounds
• A Supplemental Problems Workbook containing 100+ solved problems
• Descriptions & animations of modern process equipment
• Extra chapters on degrees of freedom, process simulation, and unsteady-state material balances
• Expert advice for beginners on problem-solving in chemical engineering


NARAYANAN & LAKSHMIKUTTY
Stoichiometry and Process Calculations
K.V. NARAYANAN, Professor and Head, Department of Chemical Engineering, Government Engineering College, Thrissur.
B. LAKSHMIKUTTY, Assistant Professor, Department of Chemical Engineering, Government Engineering College, Thrissur.

This textbook is designed for undergraduate courses in chemical engineering and related disciplines such as biotechnology, polymer technology, petrochemical engineering, electrochemical engineering, environmental engineering, safety engineering and industrial chemistry.

The chief objective of this text is to prepare students to make analysis of chemical processes through calculations and also to develop in them systematic problem-solving skills. The students are introduced not only to the application of law of combining proportions to chemical reactions (as the word ‘stoichiometry’ implies) but also to formulating and solving material and energy balances in processes with and without chemical reactions.

The book presents the fundamentals of chemical engineering operations and processes in an accessible style to help the students gain a thorough understanding of chemical process calculations. It also covers in detail the background materials such as units and conversions, dimensional analysis and dimensionless groups, property estimation, P-V-T behaviour of fluids, vapour pressure and phase equilibrium relationships, humidity and saturation.

With the help of examples, the book explains the construction and use of reference-substance plots, equilibrium diagrams, psychrometric charts, steam tables and enthalpy composition diagrams. It also elaborates on thermodynamics and thermochemistry to acquaint the students with the thermodynamic principles of energy balance calculations.


SIKDAR
Chemical Process Calculations
D.C. SIKDAR, Associate Professor, Department of Chemical Engineering, Dayananda Sagar College of Engineering, Bangalore.

Keeping the importance of basic tools of process calculations—material balance and energy balance—in
mind, the text prepares the students to formulate material and energy balance theory on chemical process systems. It also demonstrates how to solve the main process-related problems that crop up in chemical engineering practice.

The chapters are organized in a way that enables the students to acquire an in-depth understanding of the subject. The emphasis is given to the units and conversions, basic concepts of calculations, material balance with/without chemical reactions, and combustion of fuels and energy balances. Apart from numerous illustrations, the book contains numerous solved problems, short questions and exercises which bridge the gap between theoretical learning and practical implementation. All the numerical problems are solved with block diagrams to reinforce the understanding of the concepts.

Primarily intended as a text for the undergraduate students of chemical engineering, it will also be useful for other allied branches of chemical engineering such as polymer science & engineering and petroleum engineering.

KEY FEATURES

• Methods of calculation for stoichiometric proportions with practical examples from the Industry
• Simplified method of solving numerical problems under material balance with and without chemical reactions
• Conversions of chemical engineering equations from one unit to another
• Solution of fuel and combustion, and energy balance problems using tabular column


The text lucidly explains the techniques involved in analyzing different chemical processes and the underlying theories by making a generous use of appropriate worked examples. The examples are simple and concrete to make the book useful for self-instruction.

In this new edition, besides worked examples, several exercises are included to aid students in testing their knowledge of the material contained in each chapter.

The book is primarily intended for undergraduate students of Chemical Engineering. It would also be useful to undergraduate students of Petroleum Technology, Pharmaceutical Technology and other allied branches of Chemical Engineering.

KEY FEATURES

• Exposes the reader to background information on different systems of units, dimensions and behaviour of gases, liquids and solids.
• Provides several examples with detailed solutions to explain the concepts discussed.
• Includes chapter-end exercises with answers to enhance learning.


Chemical Process Control

BEQUETTE

Process Control: Modeling, Design, and Simulation

B. WAYNE BEQUETTE, Rensselaer Polytechnic Institute.

The goal of this text, designed for chemical engineering students, is to provide an introduction to the modeling, analysis, and simulation of the dynamic behaviour of chemical processes. Rather than simply present theory and develop analytic solutions, this textbook uses interactive learning through computer-based simulation exercises (modules). It teaches students the field’s most important techniques, behaviors and control problems through practical examples, supplemented by 16 hands-on learning modules that demonstrate computer simulations based on the popular MATLAB software package, including the SIMULINK block-diagram simulation environment.


Latest Print 2013 / 800 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4405-1 / ₹ 495.00

BHAGADE & NAGESHWAR
Process Dynamics and Control
SUDHEER S. BHAGADE, Professor, Department of Chemical Engineering, Anuradha Engineering College, Chikhli (Maharashtra).
GOVIND DAS NAGESHWAR has been former Director of Laxminarayan Institute of Technology, Nagpur (Maharashtra).

This well-organized and comprehensive book presents the basic concept and terminology of process control citing examples from day-to-day life. The text discusses the order of dynamic elements and their responses, transportation lag, block diagrams, final control elements, controllers, the concept of stability, techniques to tune controllers, etc. in detail. It also explains the way the elements are put together to form a loop and their interactions to each other, Ziegler–Nichols and Tyreus–Luyben controller settings, and a host of other topics that help students understand the control configuration.

Primarily intended for undergraduate students of chemical engineering, this text can also be useful for undergraduate students of electrical and mechanical engineering.

KEY FEATURES
• Provides examples of several dynamic elements from chemical industry.
• Includes a large number of diagrams illustrating the control action to be implemented.
• Gives examples of dynamic elements from chemical industry to correlate functioning of equipment from control point of view.
• Deals with both electronic and pneumatic controllers.


Latest Print 2011 / 352 pp. / 17.8 × 23.5 cm ISBN-978-81-203-2265-3 / ₹ 350.00 / (e-book also available)

SARKAR
Advanced Process Dynamics and Control
PRABIR KUMAR SARKAR has been Reader, Chemical Engineering Department, Jadavpur University, Kolkata.

This book is a sequel to the text Process Dynamics and Control (published by PHI Learning). The objective of this text is to introduce frontier areas of control technology with an ample number of application examples. It also introduces the simulation platform PCSA (Process Control System Analyzer) to include senior level worked out examples like multi-loop control of exothermic reactor and distillation column.

The textbook includes discussions on state variable techniques and analysis MIMO systems, and techniques of non-linear systems treatment with extensive number of examples. A chapter has been included to discuss the industrial practice of instrumentation systems for important unit operation and processes, which ends up with the treatment on Plant-wide-control. The two state-of-the-art tools of computer based control, Micro-controllers and Programmable Logic Controllers (PLC), are discussed with practical application examples. A number of demonstration programs have been offered for basic conception development in the accompanying CD. It familiarizes students with the real task of simulation by means of simple computer programming procedure with sufficient graphic support, and helps to develop capability of handling complex dynamic systems.

This book is primarily intended for the postgraduate students of chemical engineering and instrumentation and control engineering. Also it will be of considerable interest to professionals engaged in handling process plant automation systems.

KEY FEATURES
• Majority of worked out examples and exercise problems are chosen from practical process applications.
• A complete coverage of controller synthesis in frequency domain provides a better grasp of controller tuning.
• Advanced control strategies and adaptive control are covered with ample number of worked out examples.

SARKAR
Process Dynamics and Control (with CD-ROM)

Primarily intended as a textbook for the undergraduate students of chemical engineering, it introduces students to fundamental principles in system dynamics and control. This book bridges the conceptual gap by using a number of examples from physical as well as from different facets of human experience.

The text introduces the concepts of State variable techniques and MIMO systems. An indigenously developed simulation platform for open and close loop simulation has been introduced for analysis and design of dynamic processes. All the topics in this text are supported by quite a number of worked out and exercise problems.

The Accompanying CD with this book includes a number of computer programs to verify the results obtained during the open and closed loop dynamic studies. The CD also contains a number of Demonstration Programs, which exposes many concepts of process dynamics and control through extensive use of animated graphics.


Process Control: Concepts, Dynamics and Applications

S.K. SINGH, Head, Maintenance Services Group (Electrical) and Telecommunication, Tata Steel Limited, Jamshedpur.

Process control, a sub-discipline of automatic control, involves tailoring methods for the efficient operation of industrial processes. Proper application of process control improves the safety and profitability of a process, while maintaining consistently high product quality.

This book is a comprehensive introduction to the vast and important field of control systems. The text introduces the theory of automatic control and its applications to the chemical process industries with emphasis on topics that are of use to the process control engineers and specialists. It also covers the advanced control strategies and its practical implementation with an excellent balance of theoretical concepts and engineering practice.

KEY FEATURES
• Extensive coverage of topics such as Feedback control, Modelling, Controller design, and response analysis and stability criterion per evaluating robustness of control systems.
• Large number of illustrative figures and solved examples at the end of the chapters.
• Extensive set of review questions and self-check quizzes with answers at the end of each chapter.
• Case studies for bridging the gap between theoretical learning and practical implementation.

Designed to serve as a textbook for both undergraduate and postgraduate students of chemical engineering, this book will also be useful for mechanical, instrumentation and electrical engineers who help design process control systems.


Latest Print 2008 / 748 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3678-0 / ₹ 450.00 / (e-book also available)
This fourth edition adds new chapters introducing dynamic process simulation; advanced concepts in steady-state simulation; extensive coverage of thermodynamics packages for modeling processes containing electrolyte solutions and solids; and a concise introduction to logic control. “What You Have Learned” summaries have been added to each chapter, and the text’s organization has been refined for greater clarity. Ideal for undergraduate and postgraduate courses in Chemical Engineering.

provides the detailed drawings of some commonly used equipment. It includes numerous orthographic and assembled views of equipment, and provides several photographs to relate these drawings to equipment used in industries. Finally, the book includes several assignments to reinforce the concepts discussed in the text.

The text is intended for the undergraduate students of chemical engineering and its related branches such as polymer engineering, petroleum engineering, and pipeline engineering.


Latest Print 2012 / 152 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4496-9 / T 175.00 / (e-book also available)

Chemical Process Modelling and Simulation

JANA

Chemical Process Modelling and Computer Simulation, 2nd ed.

AMIYA K. JANA, Assistant Professor at IIT Kharagpur.

This comprehensive and thoroughly revised text, now in its second edition, continues to present the fundamental concepts of how mathematical models of chemical processes are constructed and demonstrate their applications to the simulation of two of the very important chemical engineering systems: the chemical reactors and distillation systems.

The book provides an integrated treatment of process description, mathematical modelling and dynamic simulation of realistic problems, using the robust process model approach and its simulation with efficient numerical techniques. Theoretical background materials on activity coefficient models, equation of state models, reaction kinetics, and numerical solution techniques—needed for the development of mathematical models—are also addressed in the book.

The topics of discussion related to tanks, heat exchangers, chemical reactors (both continuous and batch), biochemical reactors (continuous and fed-batch), distillation columns (continuous and batch), equilibrium flash vaporizer, and refinery debutanizer column contain several worked-out examples and case studies to teach students how chemical processes can be measured and monitored using computer programming.

The new edition includes two more chapters—Reactive Distillation Column and Vaporizing Exchangers—which will further strengthen the text.

This book is designed for senior level undergraduate and first-year postgraduate level courses in “Chemical Process Modelling and Simulation”. The book will also be useful for students of petrochemical engineering, biotechnology, and biochemical engineering. It can serve as a guide for research scientists and practising engineers as well.


Latest Print 2014 / 376 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4477-8 / T 350.00 / (e-book also available)

JANA

Process Simulation and Control Using ASPEN™, 2nd ed.

AMIYA K. JANA, Assistant Professor at IIT Kharagpur.

Solving the model structure with a large equation set becomes a challenging task due to the involvement of several complex processes in an industrial plant. To overcome these challenges, various process flow sheet simulators are used.

This book, now in its second edition, continues to discuss the simulation, optimization, dynamics and closed-loop control of a wide variety of chemical processes using the most popular commercial flow sheet simulator ASPEN™. A large variety of chemical units including flash drum, continuous stirred tank reactor, plug flow reactor, petroleum refining column, heat exchanger, absorption tower, reactive distillation, distillation train, and monomer production unit are thoroughly explained. The book acquaints the students with the simulation of large chemical plants with several single process units. With the addition of the new sections, additional information and plenty of illustrations and exercises, this text should prove extremely useful for the students.

Designed for the students of chemical engineering at the senior undergraduate and postgraduate level, this book will also be helpful to research scientists and practising engineers as a handy guide to simulation of chemical processes.

NEW TO THIS EDITION

• Section 1.3 on Stepwise Aspen Plus Simulation of Flash Drums is thoroughly updated (Chapter 1)
• Section 3.2 on Aspen Plus Simulation of the Binary Distillation Columns is updated, a new section on Simulation of a Reactive Distillation Column is added (Section 3.6), and a new topic on Column Sizing is introduced (Chapter 3)
A new section on Aspen Simulation of a Petlyuk Column with Streams Recycling is included (Chapter 4).


Latest Print 2013 / 352 pp. / 17.8 × 23.5 cm ISBN-978-81-203-4709-0 / ₹ 355.00 / (e-book also available)

Chemical Reaction Engineering

FOGLER

Elements of Chemical Reaction Engineering, 4th ed. (with Two CD-ROMs)

H. SCOTT FOGLER, Ame and Catherine Vennema Professor of Chemical Engineering, The University of Michigan, Ann Arbor.

This worldwide best-selling text, now in its fourth edition, is suitable for both undergraduate and postgraduate courses in chemical engineering and its allied disciplines such as biochemical engineering and biotechnology. It provides thorough coverage of the fundamentals of chemical reaction engineering in a framework that allows students to develop practical problem-solving skills. Woven around the six pillars of chemical reaction engineering such as mole balances, rate laws, stoichiometry, energy balances, diffusion and contracting, the book builds a strong understanding of the underlying principles and illustrates how they can be applied to numerous reactions in a variety of applications. With a combination of user-friendly software and algorithms, it helps students learn how to solve problems through reasoning, rather than by memorizing equations. Significant effort has been devoted to developing examples and problems that foster students’ critical and creative thinking. Three styles of problems—straight-forward, explorative, and open-ended—have been included to enhance the transfer of skills to real-life settings.

H. Scott Fogler has updated his classic text to provide even more coverage of bioreactions, industrial chemistry with real reactors and reactions, and a broader range of applications, along with the newest digital techniques such as COMSOL Multiphysics. The book also contains wide-ranging examples—from smog to blood clotting, ethylene oxide production to tissue engineering, anti-freeze to cobra bites, and computer chip manufacturing to chemical plant safety.

CD-ROM: The companion CD-ROM offers numerous learning resources such as summary notes, interactive computer modules, web modules, solved problems, problem-solving heuristics, POLYMATH software to explore "living example problems" and ask "what-if" questions, and many more enrichment opportunities for both students and teachers.

Colloids and Interfaces

PALLAB GHOSH, Associate Professor, Department of Chemical Engineering, Indian Institute of Technology Guwahati.

The applications of colloids and interfaces are ubiquitous in human civilization. Beginning with edibles and personal hygiene products, the applications of colloid and interface science are visible in large-scale industrial undertakings such as petroleum recovery, manufacture of heavy chemicals and coating processes. In recent times, it has grown into a multidisciplinary subject meant for study by the chemical engineers, biotechnologists, chemists, physicists and environmental scientists.

This book provides a thorough understanding of the fundamental concepts and applications of colloid and interface science. It deals with the colloid chemistry and interfacial phenomena at both fluid-fluid and solid-fluid interfaces. The emerging areas of colloid and interface science such as nanomaterials and nanotechnology have also been discussed.

The book is designed as a textbook for B.Tech. students of chemical engineering. Besides, it would also be useful to the students of biotechnology, chemistry, chemical engineering, food science, physics and environmental science, scientists and engineers working in this field will also find this book useful.

Explained with a large number of figures and solved problems, and with the aid of many unsolved problems, this text should prove to be very helpful for understanding the subject.


Latest Print 2009 / 520 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3857-9 / ₹ 425.00 / (e-book also available)

Computational Methods

AHUJA

Introduction to Numerical Methods in Chemical Engineering

PRADEEP AHUJA, Associate Professor, Department of Chemical Engineering and Technology, Institute of Technology, Banaras Hindu University, Varanasi.

This book is an exhaustive presentation of the numerical methods used in chemical engineering. Intended primarily as a textbook for BE/BTech students of chemical engineering, the book will also be useful to research and development/process professionals in the fields of chemical, biochemical, mechanical and biomedical engineering.

The initial chapters discuss the linear and nonlinear algebraic equations. The ensuing chapters cover the problems in chemical engineering thermodynamics as well as initial value problems, boundary value problems and convection–diffusion problems. Topics related to reaction chemical, dispersion and diffusion as well as steady and transient heat conduction are treated in the final chapters. The book covers a large number of numerical methods including tridiagonal matrix algorithm (TDMA) method, Newton’s method, Runge–Kutta fourth-order method, Upwind Difference Scheme (UDS) method and Alternating Direction Implicit (ADI) method. Strong emphasis is given on applications and uses of numerical analysis specifically required at the undergraduate level.

The book contains numerous worked-out examples and chapter-end exercises. The answers to all chapter-end exercises are provided. The Appendix contains a total of 33 programs in C++ related to the various numerical methods explained in the book.


Latest Print 2010 / 304 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4018-3 / ₹ 275.00 / (e-book also available)

GHOsh

Numerical Methods with Computer Programs in C++ (with CD-ROM)

PALLAB GHOSH, Assistant Professor in the Department of Chemical Engineering, IIT Guwahati.

Today, C++ is gaining prominence as a programming language and is emerging as a preferred choice of programmers because of its many attractive features and its user-friendly nature. And this text, intended for
undergraduate students of engineering as well as for students of Mathematics, Physics and Chemistry, shows how numerical methods can be applied in solving engineering problems using C++. The text, while emphasizing the application aspects, also provides deep insight into the development of numerical algorithms.

**KEY FEATURES**
- Gives detailed step-by-step description of numerical algorithms and demonstrates their implementation. Each method is illustrated with solved examples.
- Provides C++ programs on many numerical algorithms. Elementary problems from various branches of science and engineering are solved.
- Contains 79 programs written in C++.
- Provides about 200 solved examples which illustrate the concepts.
- The Exercise problems, with various categories like Quiz, Analytical and Numerical Problems and Software Development Projects, drill the students in self-study.
- The accompanying CD-ROM contains all the programs given in the book.

Students as well as programmers should find this text immensely useful for its numerous student-friendly features coupled with the elegant exposition of concepts and the clear emphasis on applications.


**Fundamentals of Cryogenic Engineering**

MAMATA MUKHOPADHYAY, Professor Adjunct, Chemical Engineering Department, Indian Institute of Technology Bombay.

Intended as a text for the undergraduate and postgraduate students of Chemical/Mechanical/Materials Engineering streams, this well-balanced book explains the fundamental principles and the applied aspects of cryogenic engineering. The author, with her vast and varied experience in teaching and allied fields, clearly enunciates the behaviour and various properties of common cryogenic fluids, methods of liquefaction, and separation and applications of cryogens with thermodynamic analysis for process selection.

This profusely illustrated study with clear-cut diagrams and process charts, should serve not only as a textbook for students but also as an excellent reference for researchers and practising engineers on design of cryogenic refrigeration, and liquefaction and separation process plants for various applications.

**KEY FEATURES**
- Discusses various application areas of cryogenics including cryogenic propellants used in space propulsion systems.
- Analyzes measurement techniques for temperature, pressure, flow rate, and liquid level, and describes the unique behaviour of cryogenic fluids and materials at cryotemperatures.
- Gives numerous solved problems and exercises that lay emphasis on honing the concepts discussed.

Engineering Biotechnology

KRISHNA PRASAD
Downstream Process Technology: A New Horizon in Biotechnology

NOORALABETTU KRISHNA PRASAD, Professor, Department of Biotechnology, P.A. College of Engineering, Mangalore, Karnataka.

Today, biochemical process industry demands fast and economic processes for the partitioning and purification of biomolecules that give high yield and high purity of the product. An integral and cost intensive part of these processes is associated with downstream processing for product isolation and purification. The aim of this comprehensive text is to provide an insightful overview of the whole aspects of downstream processing for biochemical product recovery.

Intended for undergraduate and postgraduate students of biotechnology and chemical engineering, this self-contained text includes the chapters based on the recent developments in the industry and academics. It covers the importance of the downstream processing in terms of its relevancy to modern days ever-changing consumer needs, process design criteria relevance to set objectives, and physicochemical factors that help to formulate the strategy to develop a configuration among the raw material, methodology and instruments. This overview is followed by different downstream processing steps. The text concludes with the discussion on stabilization of the product to improve the shelf life of the product.

KEY FEATURES

• Includes detailed biological, mathematical, chemical and physical aspects of downstream processing.
• Distinguishes downstream processing from analytical bioseparation.
• Contains numerous illustrations and solved problems.

Contents:

Latest Print 2011 / 372 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4339-2 / ₹ 325.00 / (e-book also available)
Food technology is the application of food science to the selection, preservation, processing, packaging, distribution and use of safe nutritious and wholesome food. The amalgamation of food technology with peripheral and integrated food engineering operations has given birth to the discipline of food engineering.

Divided into four parts, the book begins with a brief introduction to food technology and its historical importance and development in the first part. The second part covers the basic principles, materials and energy balance concepts that prepare a solid ground for easy comprehension of the technology involved.

The third part, which deals with unit operations in food processing, is the core component of the book. It includes all the transport phenomena, mechanical operations, size reduction, grinding and milling. A separate chapter is devoted to microwave heating in view of its importance in food processing. Dehydration, solvent extraction, distillation, crystallization and mechanical operations have been discussed extensively. The fourth part deals with food industry management, and the peripheral and integrated food engineering operations.

**KEY FEATURES**

- Provides numerous worked-out examples
- Explains the concepts without excessive mathematical expressions and derivations
- Covers all engineering principles that are needed for a successful operation of a food processing plant
- Includes an extensive set of review questions at the end of each chapter

The present textbook is designed for students of BTech (Food Technology/Food Engineering) and MSc (Food Technology). Besides, the students of Biochemical Engineering, Chemical Engineering and Biotechnology will find it immensely useful.


Latest Print 2012 / 576 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4499-0 / ₹ 450.00 / (e-book also available)

**SIVASANKAR**

**Food Processing and Preservation**

B. SIVASANKAR, Professor at Department of Chemistry, Anna University, Chennai.

Food science and technology is an interdisciplinary subject involving topics from chemistry, microbiology, chemical engineering and process technology. These topics need an interactive approach in order to comprehend the complexities involved in food processing and preservation. This book provides a thorough understanding of all major aspects of food processing with an emphasis on the microorganisms associated with food, before going into the problems of large-scale production and preservation of foodstuffs.

Written in a style that is student-friendly, the text introduces the important aspects of food science, such as functional role of the nutrients, the changes that the nutrients undergo during processing and preservation, and the chemical reactions responsible for spoiling various food materials as well as maintaining the organoleptic properties of foods.
Intended as a textbook for undergraduate students of science and engineering, the study would also benefit the postgraduate students offering courses in food science as well as professionals and researchers.


Heat Transfer

DUTTA

Heat Transfer: Principles and Applications

BINAY K. DUTTA, Professor, Chemical Engineering Department of Universiti Teknologi Petronas, Malaysia.

This textbook is intended for courses in heat transfer for undergraduates, not only in chemical engineering and related disciplines of biochemical engineering and chemical technology, but also in mechanical engineering and production engineering. The author provides the reader with a very thorough account of the fundamental principles and their applications to engineering practice, including a survey of the recent developments in heat transfer equipment.

The three basic modes of heat transfer—conduction, convection and radiation—have been comprehensively analyzed and elucidated by solving a wide range of practical and design-oriented problems.


Mass Transfer

ANANTHARAMAN & SHERIFFA BEGUM

Mass Transfer: Theory and Practice

N. ANANTHARAMAN, Professor in the Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli.

K.M. MEERA SHERIFFA BEGUM, Associate Professor in the Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli.

Mass transfer operations are of great importance in a
process industry as it has a direct impact on the cost of the final product. A chemical/process engineer therefore should have sound knowledge of the basics of mass transfer and its applications. This book is designed to equip the reader with sufficient knowledge of mass transfer operations and face the challenges ahead.

The objective of this textbook is to teach a budding chemical engineer the principles involved in analyzing a process and apply the desired mass transfer operation to separate the components involved. It deals with operations involving diffusion, interphase mass transfer, humidification, drying, crystallization, absorption, distillation, extraction, leaching and adsorption. The principles and equipment used for different mass transfer operations have been lucidly explained.

Designed for a two-semester course, this text is primarily intended for the undergraduate students of chemical, pharmaceutical, petrochemical engineering as well as biotechnology and industrial biotechnology. It will also be useful to plant engineers and design professionals.

KEY FEATURES
1. Explains the theoretical concepts with full derivation of equations.
2. Illustrates the application of theory through worked-out numerical examples.
3. Provides exercise problems with answers at the end of each chapter for practice.

Contents:

Latest Print 2013 / 440 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4169-2 / ₹ 375.00

DUTTA
Principles of Mass Transfer and Separation Processes
BINAY K. DUTTA, Professor, Chemical Engineering Department of Universiti Teknologi Petronas, Malaysia.

This book is a comprehensive introduction to the principles of mass transfer and their applications to major separation processes. Presenting sufficient theory and design fundamentals to ensure a sound understanding of basic concepts, this clearly written and well-organized text is suitable for courses in Mass Transfer, Separation Processes, Transport Processes, and Unit Operations offered to undergraduate students in chemical engineering. It will also be useful to postgraduate students of chemical engineering, students of allied disciplines, and practising engineers.

Progressive in approach, the phenomenon of diffusion and the concept of mass transfer coefficient have been elucidated by drawing numerous examples from diverse areas. Separation processes relevant to chemical and allied industries have been discussed in considerable depth, and the design methodologies have been illustrated. Adequate emphasis has been placed on practical applications. Details of construction and operation of various separation equipment including recent developments have been explained.

The book has about one hundred and fifty solved problems and over three hundred exercise problems, many of which directly pertain to process industries. In addition, over five hundred short and multiple choice questions have been designed to stimulate students’ understanding.

KEY FEATURES
- Provides balanced coverage of the theoretical principles and applications.
- Includes important recent developments in mass transfer equipment and practice.
- Emphasizes strong problem solving skills.
- Chapter-end problems have been superscripted 1, 2 or 3 to represent various levels of difficulty.
- Contains answers/hints to short questions, multiple choice questions and selected problems.

Solutions Manual containing the complete worked-out solutions to problems is available for instructors.


Latest Print 2014 / 960 pp. / 17.8 × 23.5 cm

SHARMA
Principles of Mass Transfer
KAL RENGANATHAN SHARMA, Professor at School of Chemical and Biotechnology, Shanmuga Arts Science Technology & Research Academy, Sastra University, Tamil Nadu.

This book addresses the specific needs of undergraduate chemical engineering students for the two courses in Mass Transfer I and Mass Transfer II. It is also suitable for a course in Downstream Processing for biotechnology students.

This self-contained textbook is designed to provide single-volume coverage of the full spectrum of techniques for chemical separations. The operations covered include vapour distillation, fluid adsorption, gas absorption, liquid extraction, solid leaching, gas humidification, solid drying, foam separation, solution crystallization, metal alloying, reverse osmosis, molecular sieves, electrodialysis, and ion exchange.
The text also discusses emerging applications such as drug delivery, gel electrophoresis, bleaching, membrane separations, polymer devolatilization, solution crystallization, and gas chromatography.

Equipment selection is discussed for different operations. A table of industrial applications for each and every mass transfer unit operation is provided. The worked examples illustrate problems from chemical process and biotechnology industries. Review questions encourage critical thinking, and end-of-chapter problems emphasize grasping of the fundamentals as well as illustrate applications of theory to a wide variety of scenarios.

**KEY FEATURES**
- Includes several case studies ranging from manufacture of vitamin C, prilling tower to granulate urea to vanaspati discolouration and wilting of the lettuce.
- Introduces generalized Fick's law of diffusion.
- Discusses hollow fibre mass exchangers.
- Introduces new concepts such as cosolvent factor, Z step procedure for multistage cross-current extraction.


**Polymer Engineering**

**Polymer Science and Technology, 2nd ed.**

JOEL R. FRIED, Professor of Chemical Engineering and Past Director of the Polymer Research Center, and Head of the Department of Chemical and Materials Engineering at the University of Cincinnati.

The book presents both the current state of polymer science and technology, and emerging advances in the field. The author offers thoroughly updated coverage of polymers processing principles and the latest polymer applications in a wide range of industries—including medicine, biotechnology, chemicals, and electronics.

In addition to synthetic polymer chemistry, the book covers polymer properties in solution and in melt, rubber, and solid states, and surveys all important categories of plastics. This edition also adds many new example calculations, homework problems, and bibliographic references. In-depth coverage includes:
- Polymer synthesis, including metallocene catalysis, atom-transfer radical and plasma polymerization, the use of superficial fluids, and genetic engineering
- Amorphous and crystalline states, transitions, and mechanical properties
- Characterization techniques, including new coverage of temperature-modulated DSC
- Polymer engineering, from rheology to modelling of polymer processing operations
- Fundamental principles of polymer blends and composites—including up-to-the-minute discussions of nanocomposites
- Commodity thermoplastics and fibres, with new coverage of syndiotactic polystyrene, biopolymers, and naturally occurring polymers
- Engineering and specialty polymers, including dendrimers and hyperbranched polymers, amorphous Teflon, and new electrical/optical applications
• Membrane separations and new coverage of barrier polymers


Latest Print 2013 / 600 pp. / 17.8 \times 23.5 \text{ cm} ISBN-978-81-203-2770-2 / \text{₹} 425.00

KARAK
Fundamentals of Polymers: Raw Materials to Finish Products

NIRANJAN KARAK, Professor of Polymer Science and Technology in Chemical Sciences Department, Tezpur University.

This systematically organized text gives a clear understanding of the basic concepts of polymer science and technology and presents the preparation, characterization, properties and applications of polymers. The book discusses the raw materials for polymers, polymer forming processes and the various techniques of polymerization. It explains the modification of polymers and all types of additives used with polymers in their end applications. The book also describes the analytical, instrumental and spectroscopic techniques for testing and characterizing polymers, as well as covers the structures and properties of polymers along with their processing and applications. Thermoplastic and thermosetting polymers with a main focus on their manufacturing processes, structures and properties are also discussed. A comparative study of conventional linear polymers and advanced highly branched macromolecules has been included. Finally, a discussion on the basic idea and manufacturing process of some polymer-based industrial products adds value to this text.

KEY FEATURES
• Presents advanced topics such as dendritic polymers and polymer nanocomposites.
• Includes a number of illustrations to reinforce the understanding of the subject.
• Contains chapter-end exercises for practice.

This book is designed for the undergraduate and postgraduate students of chemical engineering, polymer science and technology, and rubber science and technology. It is also useful to postgraduate students of applied and industrial chemistry.


Latest Print 2009 / 304 pp. / 17.8 \times 23.5 \text{ cm} ISBN-978-81-203-3877-7 / \text{₹} 275.00 / (e-book also available)

Separation Processes

KRISHNA PRASAD
Downstream Process Technology: A New Horizon in Biotechnology

NOORALABETTU KRISHNA PRASAD, Professor, Department of Biotechnology, P.A. College of Engineering, Mangalore, Karnataka.

Today, biochemical process industry demands fast and economic processes for the partitioning and purification of biomolecules that give high yield and high purity of the product. An integral and cost intensive part of these processes is associated with downstream processing for product isolation and purification. The aim of this comprehensive text is to provide an insightful overview of the whole aspects of downstream processing for biochemical product recovery.

Intended for undergraduate and postgraduate students of biotechnology and chemical engineering, this self-contained text includes the chapters based on the recent developments in the industry and academics. It covers the importance of the downstream processing in terms of its relevancy to modern days ever-changing consumer needs, process design criteria relevance to set objectives, and physicochemical factors that help to formulate the strategy to develop a configuration among the raw material, methodology and instruments. This overview is followed by different downstream processing steps. The text concludes with the discussion on stabilization of the product to improve the shelf life of the product.

KEY FEATURES
• Includes detailed biological, mathematical, chemical and physical aspects of downstream processing.
• Distinguishes downstream processing from analytical bioseparation.
• Contains numerous illustrations and solved problems.

NATH
Membrane Separation Processes
KAUSHIK NATH, Assistant Professor and Head, Department of Chemical Engineering, G.H. Patel College of Engineering and Technology, Vallabh Vidyanagar, Gujarat.

This concise and systematically organized text gives a clear insight into various membrane separation processes, covering the fundamentals as well as the recent developments of different processes as well as their industrial applications and the products. It covers the basic principles, operating parameters, types of membrane used, flux equation, transport mechanism, and applications of membrane-based technologies.

Membrane separation processes are largely rate-controlled separations which require rate analysis for complete understanding. Moreover, a higher level of mathematical analysis, along with the understanding of mass transfer, is also required. These are amply treated in different chapters of the book to make the students comprehend the membrane separation principles with ease. The book has a sufficient number of examples and exercises, thus making it student friendly.

KEY FEATURES
• Provides sufficient numbers of examples of industrial applications related to chemical, metallurgical, biochemical and food processing industries.
• Focuses on important biomedical applications of membrane-based technologies such as blood oxygenator, controlled drug delivery, plasma-pheresis, and bioartificial organs.
• Includes chapter-end short questions and problems to test students’ comprehension of the subject.

This textbook is primarily designed for undergraduate students of chemical engineering, biochemical engineering and biotechnology for the course in membrane separation processes. Besides, the book will also be useful to process engineers and researchers.


Latest Print 2012 / 336 pp. / 16.0 × 24.1 cm

SHULER & KARGI
Bioprocess Engineering: Basic Concepts, 2nd ed.
MICHAEL L. SHULER, Cornell University.
FIKRET KARGI, Dokuz Eylul University.

This comprehensive, fully updated text introduces the essential concepts of biochemical and bioprocess engineering to students in chemical engineering and those pursuing courses in related disciplines. The authors first review the relevant fundamentals of biochemistry, microbiology, and molecular biology, introducing key principles that enable bioprocess engineers to achieve consistent control over biological activity. The text then reflects the advances that are transforming the field, ranging from genetic sequencing to new techniques for producing proteins from recombinant DNA. It introduces techniques with broad applications to the production of pharmaceuticals, biologics, and commodities. It also covers medical applications such as tissue engineering and gene therapy and those used for solving critical environmental problems.


Latest Print 2014 / 576 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2110-6 / ₹ 450.00

SIVASANKAR
Bioseparations: Principles and Techniques
B. SIVASANKAR, Professor, Department of Chemistry, Anna University, Chennai.

This systematically organized and well-balanced book compresses within the covers of a single volume the theoretical principles and techniques involved in bioseparations, also called downstream processing. These
techniques are derived from a range of subjects, for example, physical chemistry, analytical chemistry, biochemistry, biological science and chemical engineering. Organized in its 15 chapters, the text covers in the first few chapters topics related to chemical engineering unit operations such as filtration, centrifugation, adsorption, extraction and membrane separation as applied to bioseparations. The use of chromatography as practiced at laboratory as well as industrial scale operation and related techniques such as gel filtration, affinity and pseudoaffinity chromatography, ion-exchange chromatography, electrophoresis and related methods have been discussed. The important applications of these techniques have also been highlighted.

**DISTINGUISHING FEATURES**
- Basic principles involved in the various techniques are dealt with illustrative diagrams and description.
- Worked examples are given at the end of relevant chapters.
- An overview of entire course/subject of bio-separations is presented in Chapter 1.

The book is intended primarily as a textbook for undergraduate and postgraduate students of biotechnology—both in science and engineering. Some of the topics covered would also greatly benefit students who wish to specialize on certain areas as well as those in the industry engaged in biotechnology research.


**GEANKOPLIS**

**Transport Processes and Separation Process Principles (Includes Unit Operations), 4th ed.**

CHRISTIE JOHN GEANKOPLIS, *University of Minnesota.*

The title of this thoroughly updated fourth edition has been changed from *Transport Processes and Unit Operations to Transport Processes and Separation Process Principles (Includes Unit Operations)* to reflect the modern nomenclature being used. This book designed for chemical engineering students and professionals provides a sound understanding of principles and practical applications of momentum, heat, and mass transfer processes, as well as separation processes. The text is divided into two parts. Part 1 covers the
essential principles underlying transport processes: momentum transfer; steady-state and unsteady-state heat transfer; and mass transfer, including both unsteady-state and convective mass transfer. Part 2 covers key separation processes, including evaporation, drying, humidification, absorption, distillation, adsorption, ion exchange, extraction, leaching, crystallization, dialysis, gas membranes, reverse osmosis, filtration, ultrafiltration, microfiltration, settling, centrifugal separation, and more. This edition’s extensive updates and enhancements include:

A more thorough coverage of momentum, heat, and mass transport processes.

Detailed new coverage of separation process applications.

Greatly expanded coverage of momentum transfer, including fluidized beds and non-Newtonian fluids.

More detailed discussions of mass transfer, absorption, distillation, liquid–liquid extraction, and crystallization.

New coverage of membrane separation processes and gas-membrane theory.

The book features more than 240 example problems and over 550 end-of-chapter problems reflecting the field’s current methods and applications.


Civil Engineering Construction Practices

VARGHESE
Building Construction

P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

This book, a companion volume to the author’s book on Building Materials, explains the basics of building construction practices in an accessible style. It discusses in detail every element of building construction from start to the finish—from site preparation to provision of services (such as water supply, drainage and electricity supply). Besides, the text describes acoustics and maintenance of buildings, which are important considerations in construction of buildings.

This book is primarily designed as an introductory textbook for undergraduate students of civil engineering as well as those pursuing diploma courses in civil engineering and architecture. Practising engineers and any person who has a keen interest in the construction
and maintenance of his/her own building will also find the book very helpful.

**KEY FEATURES**
- Separate Appendix is given to discuss earthquake-resistant design of buildings.
- Review Questions provided at the end of each chapter enable the readers recapitulate the topics.
- The references to IS codes and standards make the text suitable for further study and field use.
- Because of the lecture-based presentation of the subject, the text will be of considerable benefit for the young teachers for their classroom lectures.

**Contents:**
- Foreword.
- Preface.
- Acknowledgements.
- Components of a Building and Building Specifications.
- Site Preparation and Setting Out of Works.
- Earthwork and Anti-termite Treatment.
- Construction of Foundation.
- Brick Masonry.
- Block Masonry.
- Stone Masonry.
- Arches and lintels.
- DPC and Waterproofing of Basements.
- Concrete Work.
- Temporary Works: Formwork and Scaffolding.
- Bending and Placing of Reinforcement in RCC Works.
- Plastering and Pointing.
- Flooring—General Considerations.
- Concrete and Brick Floors.
- Stone Floors.
- Ceramic Tile Floors and Walls.
- Resilient Floors.
- Woodblock and Parquet Flooring.
- Terrazzo Work.
- Flat-floor and Flat-roofs Constructions.
- Sloped Roofs.
- Windows and Ventilators.
- Timber Joints and Glazing.
- Stairs and Lifts.
- Painting.
- Waterproofing and Weatherproofing of Basements.
- Roof Drainage and Repair of Leakage.
- Water Supply in Buildings.
- Drainage of Wastewater and Sewage above Ground.
- Drainage of Foul Water below the Ground Level.
- Electricity Supply in Buildings.
- Common Equipment Used in Construction of Ordinary Buildings.
- Municipal Requirements in Planning of Buildings.
- Design of Buildings for Comfort in Hot Climates.
- Acoustics of Buildings.
- Welding and Structural Steelworks.
- Joining Pipes.
- Miscellaneous Works.
- Maintenance of Buildings.
- Appendices—A. Design of Brick Masonry Walls.
- C. Estimating Costs and Material Requirements.
- E. Equivalent Plain Areas of Uneven Surfaces for Payment for Painting of Building Works.

**Computer-Aided Analysis and Design**

S. GHOSHAL, Department of Civil Engineering, Birla Institute of Technology and Science, Pilani.

This book is extremely useful to engineering students who wish to increase their efficiency in the usage of computers as a problem solving tool. The text shows how to equip oneself with fundamental techniques of a good user-interface development, such as planning for screen management, usage of peripheral devices like mouse or pen plotter, simple and effective graphics tricks and a few
basics of file management. Simulation, Expert Systems, Analytical Tools and DBMS are introduced and discussed with adequate conceptual and software examples.

**KEY FEATURES**

- Practical tips for screen management to develop a friendly user-interface.
- Interfacing techniques of peripheral devices such as, Mouse, Printer, CRT, Plotter, etc.
- Subroutines for mouse and plotter interfaces through serial ports and graphics techniques, like moving a cursor without erasing the background, rubber-band technique, etc.
- A complete chapter on simulation, a powerful problem solving tool for engineers.
- Simple engineering examples on Expert Systems and AI.
- A complete case study of a full-length CAAO problem involving real-time data acquisition, simulation, data-processing, storing and presentation of results through screen, printer and plotter.
- Example programs in C, Pascal and Basic.


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**Concrete Technology**

BANDYOPADHYAY

**Design of Concrete Structures**

J.N. BANDYOPADHYAY, Professor of Civil Engineering, Indian Institute of Technology Kharagpur.

This text primarily analyses different methods of design of concrete structures as per IS 456: 2000 (Plain and Reinforced Concrete—Indian Standard Code of Practice, 4th revision, Bureau of Indian Standards). It gives greater emphasis on the limit state method so as to illustrate the acceptable limits for the safety and serviceability requirements of structures.

Besides dealing with yield line analysis for slabs, the book explains the working stress method and its use for designing reinforced concrete tension members, theory of redistribution of moments, and earthquake resistant design of structures. This well-structured book develops an effective understanding of the theory through numerous solved problems, presenting step-by-step calculations. The use of SP-16 (Design Aids for Reinforced Concrete to IS: 456–1978) has also been explained in solving the problems.

**KEY FEATURES**

- **Instructional Objectives** at the beginning of the chapter highlight important concepts.
- **Summary** at the end of the chapter to help student revise key points.
- **Sixty-nine solved illustrative examples** presenting step-by-step calculations.
- Chapter-end exercises to test student’s understanding of the concepts.
- **Forty Tests** to enable students to gauge their preparedness for actual exams.

This comprehensive text is suitable for undergraduate students of civil engineering and architecture. It can also be useful to professional engineers.


Latest Print 2014 / 612 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3277-5 / ₹ 450.00

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**GHOSH Prestressed Concrete: Analysis and Design Practice of Members**

KARUNA MOY GHOSH, formerly Chief Structural Engineer in Kaiser Engineers, Inc., and also Mott MacDonald Group (UK), and W.S. Atkins & Partners (India).

This book addresses an overall approach presenting comprehensive principles and description of the analysis and design of prestressed concrete members—from its initial design concepts, analysis, to the construction stage. The structural components are analyzed and designed to conform to the requirements of Eurocodes [that are similar to Indian Standard Codes] followed throughout the world.

In order to elaborate on the concept of prestressed concrete, seven different cases are dealt with in this book to give a practical insight of the subject to the students. The concepts explained are well-supported with the mathematical derivations and problem calculations. Illustrative figures and tables further makes the understanding of the concepts easier.

The book serves as a reference for the undergraduate students of civil and structural engineering.


Latest Print 2014 / 200 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4843-1 / ₹ 225.00 / (e-book also available)

Engineering Geology

VARGHESE
Engineering Geology for Civil Engineers
P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

Geology is the science of earth's crust (lithosphere) consisting of rocks and soils. While mining and mineralogical engineers are more interested in rocks, their petrology (formation) and mineralogy, civil engineers are equally interested in soils and rocks, in their formations, and also in their properties for civil engineering design and construction. This book is so written that the subject can easily be taught by a civil engineering faculty member specialised in soil mechanics.

Dexterously organized into four parts, this book in Part I (Chapters 1 to 11) deals with the formation of rocks and soils. The classification of soils, lake deposits, coastal deposits, wind deposits along with marshes and bogs are described in Part II (Chapters 12 to 20). As the book advances, it deals with the civil engineering problems connected with soils and rocks such as landslides, rock slides, mudflow, earthquakes, tsunami and other natural phenomena in Part III (Chapters 21 to 24). Finally, in Part IV (Chapters 25 to 30), this text discusses the allied subjects like the origin and nature of cyclones, rock mass classification and soil formation.

Designed to serve as a textbook for the undergraduate students of civil engineering, this book is equally useful for the practising civil engineers.

SALIENT FEATURES

- Displays plenty of figures to clarify the concepts
- Includes chapter-end review exercises to enhance the problem-solving skills of the students
- Summary at the end of each chapter brings into focus the essence of the chapter
- Appendices at the end of the text supplies extra information on important topics


Latest Print 2014 / 264 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4495-2 / ₹ 250.00 / (e-book also available)

Environmental Engineering

GRAEDEL & ALLENBY
Industrial Ecology and Sustainable Engineering
T.E. GRAEDEL, Yale University. B.R. ALLENBY, Arizona State University.

The first book of its kind devoted completely to the emerging field of industrial ecology/green engineering, this introduction uses industrial ecology principles and cases to ground the discussion of sustainable engineering—and offers practical and reasonable approaches to design decisions.

It is a useful reference for professionals in environmental science, environmental policy, and engineering.

The text provides:

- Methods to better incorporate concerns about environmental and social issues into design decisions—from the level of products and manufacturing processes to factories and material flow systems—are discussed.
- A complete suite of homework problems is included.


HENRY & HEINKE
Environmental Science and Engineering, 2nd ed.
J. GLYNN HENRY, Professor Emeritus of Civil Engineering, University of Toronto and President, J.G. Henry Associates Ltd., Consulting Environmental Engineers.
GARY W. HEINKE, Professor of Civil Engineering, University of Toronto.
Designed as an introductory-level core textbook on environmental science and engineering for students of engineering as well as for non-engineering undergraduates offering courses in environmental science, this book provides an in-depth analysis of the subject. This updated second edition is a result of the wide acceptance of the first edition and is based on the feedback and constructive comments received from the students and faculty on the previous edition. It has contributions from experts in the field—drawn both from the academic field and from the industry.
The book is divided into three parts: Part I: Causes of Environmental Problems gives updated data on increasing population, urbanization, energy use and the consequences of natural and human environmental disturbances, sustainable development and preventive technology. Part II: The Scientific Background includes a review of physics and chemistry, with additional information on atmospheric sciences, climatology, meteorology and epidemiology. Part III: Technology and Control provides current information on water use, drinking water standards, and alternative wastewater treatment. It also includes discussion on biosolids management, water resources, water supply, and water pollution and air pollution sources. New case studies and site remediation techniques are integrated with chapters on solid and hazardous wastes.
The book is enriched with over 300 problems and examples making it an ideal text for students. Besides, it would prove useful to the practising engineers and the teaching community.


Masters & Ela
Introduction to Environmental Engineering and Science, 3rd ed.
GILBERT M. MASTERS and WENDELL P. ELA.
The third edition of this book has been completely updated, modestly expanded and significantly strengthened—especially in the area of water quality engineering. The revisions have been made with the aim of providing students with the necessary tools and understanding of topics in chemistry, water treatment, air pollution and solid waste components. The text maintains its accessibility to non-engineering and hard science students as well. This blend of technical rigour and broad accessibility has been a goal of the previous editions and it continues to be an explicit objective of this edition too. Designed for use in undergraduate courses on environmental engineering and science.

NEW TO THIS EDITION
1. More Applied Applications—Greenhouse Gases, Hurricane Katrina, Global Warming
2. Inclusion of Plug Flow Discussion
3. Added Discussions on Topics—Deforestation, Soil Erosion, Species Extinction


MEENAKSHI
Elements of Environmental Science and Engineering, 2nd ed.
P. MEENAKSHI, Department of Civil Engineering, Coimbatore Institute of Technology, Coimbatore, Tamil Nadu.
Designed as a text for all undergraduate students of engineering for their core course in Environmental
Science and Engineering and for elective courses in environmental health engineering and pollution and control engineering for students of civil engineering, this comprehensive text provides an in-depth analysis of the fundamental concepts. It also introduces the reader to different niche areas of environmental science and engineering.

The book covers a wide array of topics, such as natural resources, disaster management, biodiversity, and various forms of pollution, viz. water pollution, air pollution, soil pollution, noise pollution, thermal pollution, and marine pollution, as well as environmental impact assessment and environmental protection.

KEY FEATURES
- Provides in-depth yet lucid analysis of topics, making the book user-friendly.
- Covers important topics, which are adequately supported by illustrative diagrams.
- Provides case studies to explore real-life problems.
- Supplies review questions at the end of each chapter to drill the students in self-study.


New to this edition:
- A revised and expanded section about on-site wastewater disposal
- A new section about alternative wastewater collection systems
- A new section on wastewater treatment plant operation and maintenance
- Additional case studies and examples of Geographic Information Systems (GIS) applications
- Highlighted key terms and an expanded glossary End-of-chapter summaries

“The text is well designed, current, and has excellent figures, illustrations, and examples.”
—Michael D. Turner, Northeastern State University, Tahlequah, Oklahoma


NATHANSON
Basic Environmental Technology: Water Supply, Waste Management, and Pollution Control, 5th ed.
JERRY A. NATHANSON, Union County College, Cranford, New Jersey.

This text offers a practical introduction to a wide range of environmental topics, focusing primarily on water and wastewater, solid and hazardous waste, and air and noise pollution control. It emphasizes fundamental concepts and basic applications so that students with little or no experience in biology, chemistry, geology, or hydraulics can comprehend this book.

KEY FEATURES
- A clear easy-to-read style
- Presentation of mathematical topics at a relatively basic level
- Hundreds of example problems, diagrams, and photographs
- Numerous chapter review questions and practice problems
- Use of both SI and U.S. customary units
- An appendix containing a basic math review.

RANA
S.V.S. RANA, former Vice Chancellor of Bundelkhand University, Jhansi. He has served Chaudhary Charan Singh University, Meerut as Professor and Head, Department of Zoology; Coordinator, Department of Environmental Science; and Coordinator, UGC Innovative Assistance Program in Toxicology.

This revised fifth edition, is a lucid presentation of the fundamental concepts and principles of ecology and environmental science. Extensively illustrated, the book provides in-depth coverage of major areas such as atmospheric and soil science, hydrobiology, biodiversity, and pollution ecology. It seeks to impart comprehensive understanding of the major ecological issues, policies and laws, crucial for solving environmental problems. New sections on vital topics such as acid rain and deposition, metapopulations, environmental disasters and the Bali Summit on Climate Change 2007 contribute strongly to this endeavour.

The book is primarily intended for undergraduate (B.Sc.) students of environmental science and other relevant biological sciences. It will also be very useful for postgraduate (M.Sc.) students of these subjects as well as field professionals and researchers.
KEY FEATURES
• Use of indigenous examples for explaining subject matter
• Coverage of extreme environments such as Antarctica, the Arctic region, open oceans, and deserts, along with up-to-date information on major ecosystems
• Chapters devoted to biodiversity as well as natural and genetic resources of India
• Detailed descriptions of ecocompartments such as atmosphere and lithosphere


Latest Print 2013 / 608 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4786-1 / ₹ 375.00 / (e-book also available)

RAO
Principles of Environmental Science and Engineering
P. VENUGOPALA RAO, Former Faculty JNTU, and Visiting Faculty and Advisor to various Private Engineering Colleges, Hyderabad.

Primarily intended as a text for undergraduate students of engineering for their core course in environmental studies, this book gives a clear introduction to the fundamental principles of ecology and environmental science and aptly summarizes the relationship between ecology and environmental engineering. Divided into three parts, the book begins by discussing the biosphere, natural resources, ecosystems, biodiversity, and community health. Then it goes on to give detailed description on topics such as pollution and control, environmental management, and sustainable development. Finally, it focuses on environmental chemistry, environmental microbiology, and monitoring and analysis of pollutants.

KEY FEATURES
• Key words and summary at the end of each chapter provide the students an easy way of recapitulation.
• A large number of figures illustrate the topics discussed.
• Projects of environmental concern suggested at the end of the book enable the students to work in field projects.

Besides engineering students, undergraduate students in other streams, practicing engineers and professionals would find the text immensely useful.


Latest Print 2012 / 288 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-2893-8 / ₹ 225.00 / (e-book also available)
SINCERO & SINCERO

Environmental Engineering: A Design Approach (with CD-ROM)

ARCADIO P. SINCERO, Morgan State University.
GREGORIA A. SINCERO, Maryland Department of the Environment.

This comprehensive textbook dealing with environmental engineering provides a thorough treatment of the subject in all its aspects—water and wastewater, environmental hydrology, hydraulics and pneumatics, air, solid waste, noise and environmental quality modeling. The text makes use of practical hands-on examples and current applications.

KEY FEATURES

• In-depth coverage of the applications of chemical reactions is included.
• Example problems illustrate the techniques of design using the concepts presented in the text.
• Treats surface water, subsurface water and air quality modeling as part of the concept of conservation of mass.
• Provides a unified approach to the concept of settling and cake filtration, treating and settling of air and water together.


Latest Print 2014 / 816 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-1474-0 / ₹ 550.00

SRINIVASAN

Environmental Engineering

D. SRINIVASAN, Professor, Department of Chemical Engineering, Anna University, Chennai.

During the last two decades, the environmental pollution regulations have undergone a vast change. Attempts have been made to refine the conventional technologies and to develop new technologies to meet increasingly more stringent environmental quality criteria. The challenge that one faces today is to meet these stringent requirements in an environmentally acceptable and cost effective manner.

The present book addresses the application of the state-of-the-art technology to the solutions to today’s problems in industrial effluent pollution control and environmental protection. The highlight of this book is the inclusion of the salient features of process modifications and other important methods and techniques for the minimization of wastes. The chapter on process modification for waste minimization provides new technical features and tools, latest technologies and techniques, and other industrial operations. Besides, the text covers the role of an environmental engineer in the methodology for making pollution control decisions.

KEY FEATURES

• Includes numerous self-explanatory tabular and diagrammatic representations.
• Presents pollution problems of few chemical and processing industries.
• Provides case studies on environmental pollution problems and their prevention.
• Analyzes thoroughly the planning and strategies of environmental protection.

Designed as a textbook for the undergraduate students of civil and chemical engineering, this book will also be useful to the postgraduate students of environmental science and engineering.


Latest Print 2012 / 440 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3600-1 / ₹ 350.00 / (e-book also available)

SULPHEY

Introduction to Environment Management

M.M. SULPHEY, Professor, TKM Institute of Management, Karuveli, Kerala.

A perfect harmony between man and environment is the essence of healthy life and sustainable growth. And therefore, maintenance of ecological balance and a pristine environment is the need of the hour. This comprehensive book on environmental management discusses various aspects of environment, the ecosystems, effects of global warming and pollution, and various ways to conserve nature and save environment.

The eight sections of the book virtually are the eight fundamental components which, in one way or the other, play a crucial role in managing the environment. The book begins with the section on Ecology and classification of ecosystems. It then moves onto the next section on Biodiversity, which discusses the Biodiversity Acts. The book progresses by discussing the third most important section on Environmental degradation, its causes, which include global warming, pollution (air, land and water) and prevention and control. India is an agriculture-based
The book highlights problems such as public health and safety, right to carry on trade vis-à-vis duty to protect environment, right to information about hazardous installations, right to clean environment, and ecological balance for sustainable development. It stresses the need for striking a balance between environment and development to bring about sustainable development. Finally, the text shows how important it is to formulate a legal framework for environmental protection.

KEY FEATURES

- While giving a broad conceptual overview of environmental law, the text explains the major environmental laws, examines the relevant provisions, and traces the origin of constitutional support to environmental protection.
- Refers to all leading cases on environmental law and highlights the role of judiciary on entertaining as well as restraining public interest litigations (PILs) to stop environmental violations.
- Provides Appendices containing various environmental laws.
- The accompanying CD-ROM contains text of all relevant environmental laws—both general and specific—to help readers have access to those laws instantly.

Primarily intended as a text for students of law (LL.B./BA LL.B./LL.M., MBL) and management (MBA), the book should also prove to be an excellent reference for academics, lawyers, judges, environmental activists, environmental managers and corporates concerned with environmental protection.

Finite Element Analysis

ALAVAVAL

Finite Element Methods: Basic Concepts and Applications

CHENNakesava R. ALAVAVAL, Professor in the Department of Mechanical Engineering, Jawaharlal Nehru Technological University (JNTU), Hyderabad.

Finite Element Methods form an indispensable part of engineering analysis and design. The strength of FEM is the ease and elegance with which it handles the boundary conditions. This compact and well-organized text presents a comprehensive analysis of Finite Element Methods (FEM).

The book gives a clear picture of structural, torsion, free-vibration, heat transfer and fluid flow problems. It also provides detailed description of equations of equilibrium, stress-strain relations, interpolation functions and element design, symmetry and applications of FEM. The text is a synthesis of both the physical and the mathematical characteristics of finite element methods. A question bank at the end of each chapter comprises descriptive and objective type questions to drill the students in self-study.

KEY FEATURES
- Includes step-by-step procedure to solve typical problems using ANSYS® software.
- Gives numerical problems in SI units.
- Elaborates shaper functions for higher-order elements.
- Furnishes a large number of worked-out examples and solved problems.

This profusely illustrated, student-friendly text is intended primarily for undergraduate students of Mechanical/Production/Civil and Aeronautical Engineering. By a judicious selection of topics, it can also be profitably used by postgraduate students of these disciplines. In addition, practising engineers and scientists should find it very useful besides students preparing for competitive exams.


Latest Print 2014 / 408 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3584-4 / ₹ 325.00 / (e-book also available)

BATHE

Finite Element Procedures

KLAUS-JÜRGEN BATHE, Professor of Mechanical Engineering, Massachusetts Institute of Technology.

This practical textbook is the revised edition of the author’s classic and includes the state-of-the-art methods in finite element procedures. The revision is thorough and comprehensive which makes the book more broad based.

The text explores the full range of finite element methods, but concentrates on certain finite element procedures such as techniques that are essential and often used in engineering practice. Written by a highly respected author on the subject, the text presents, in sufficient details, both the elementary concepts and advanced techniques while presenting statics, dynamics, solids, fluids, linear and nonlinear analysis.

Adequate attention is given to both the physical and mathematical characteristics of the procedures. Throughout the text, a representative selection of

Latest Print 2014 / 484 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2106-9 /₹ 475.00

NEW TO THIS EDITION

- Provides an in-depth analysis of strength and deformability of jointed rock mass.
- Discusses the application of air pressure function for solving problems in solid mechanics.
- Adds a new chapter on Analysis of Rock Bolts.
- Contains two new appendices—Gauss Quadrature Rule and Closed Form Integration in Natural Coordinates.
- Includes several new worked-out examples and exercises.
- Interaction between rock bolt and rock mass is analyzed


Latest Print 2013 / 376 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4295-8 / ₹ 350.00 / (e-book also available)

Manish Shrikhande
Textbook of Finite Element Analysis
P. Seshu, Associate Professor, Mechanical Engineering Department, IIT Bombay.

This accessible, easy-to-read text presents finite element method (FEM) as a tool to find approximate solutions to differential equations rather than presenting it as a tool to solve structural mechanics problems alone. Such an approach provides the students a better perspective on the technique and its wide range of applications in engineering.

The text draws many worked-out examples from the field of structural mechanics, heat transfer and fluid flow, which illustrate the important concepts.

Illustrated primarily as a textbook for postgraduate/senior undergraduate students of mechanical, civil and aeronautical engineering for a one-semester course in FEM, the book would also be useful to the practising engineers in the industry.


Latest Print 2014 / 340 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2315-5 / ₹ 275.00 / (e-book also available)

Shrikhande
Finite Element Method and Computational Structural Dynamics
(with DVD)

Manish Shrikhande, Professor at Department of Earthquake Engineering, Indian Institute of Technology Roorkee, and a member of Indian Society of Earthquake Technology and Earthquake Engineering Research Institute.

Primarily intended for senior undergraduate and postgraduate students of civil, mechanical and aerospace/aeronautical engineering, this text emphasises the importance of reliability in engineering computations and understanding the process of computer aided engineering.

Written with a view to promote the correct use of finite element technology and to present a detailed study of a set of essential computational tools for the practice of structural dynamics, this book is a ready-reckoner for an in-depth discussion of finite element theory and estimation and control of errors in computations. It is specifically aimed at the audience with interest in vibrations and stress analysis. Several worked out examples and exercise problems have been included to describe the various aspects of finite element theory and modelling. The exercise on error analysis will be extremely helpful in grasping the essence of posteriori error analysis and mesh refinement.

Key features:
- Thorough discussion of numerical algorithms for reliable and efficient computation.
- Ready-to-use finite element system and other scientific applications.
- Tips for improving the quality of finite element solutions.
- Companion DVD containing ready to use finite element applications.


Latest Print 2014 / 484 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4995-7 / ₹ 550.00 / (e-book also available)

Srinivas, et al.
Finite Element Analysis Using ANSYS® 11.0

Paleti Srinivas, Associate Professor in the Department of Mechanical Engineering, GITAM Institute of Technology, GITAM University, Visakhapatnam. Krishna Chaitanya Sambana, Design Engineer and presently working in the Piping Engineering Department of Jacobs Engineering India Pvt. Ltd. Rajesh Kumar Datti is presently working with the Engineering & Industrial Services division of TATA Consultancy Services Ltd.

This book is designed for students pursuing a course on
Finite Element Analysis (FEA)/finite Element Methods (FEM) at undergraduate and postgraduate levels in the areas of mechanical, civil, and aerospace engineering and their related disciplines. It introduces the students to the implementation of finite element procedures using ANSYS® FEA software. The book focuses on analysis of structural mechanics problems and imparts a thorough understanding of the functioning of the software by making the students interact with several real-world problems. To this end:

- 38 problems have been solved thoroughly in ANSYS® Multiphysics™, two problems solved in ANSYS® Workbench™, and 12 problems solved using FEM.
- 135 problems have been given as exercises.

Besides students, the book will be also immensely useful as a reference to practising engineers and consultants. Organized into eight chapters, the book begins with an introduction to the finite element method and discusses its application to solid and structural mechanics problems through simple examples. The readers are then exposed to the ANSYS® graphical user interface along with a general procedure for solving static structural problems. A generalized step-by-step procedure is presented throughout the book for analysis of trusses, beams, plane stress and plane strain analysis, axisymmetric and three-dimensional solids, etc. Finally, the book ends with an analysis of miscellaneous engineering problems using pipe, cable, link elements, etc., and also provides the procedure for the generation of engineering reports using ANSYS®.

**Contents:**

Latest Print 2014 / 548 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4108-1 / ₹ 525.00 / (e-book also available)

**Fluid Mechanics and Hydraulic Machines**

**BALACHANDRAN**

**Engineering Fluid Mechanics**

P. BALACHANDRAN, Senior Scientist and a Divisional Head, Propulsion Research Division in LPSC—Indian Space Research Organisation (ISRO), Trivandrum.

Engineering Fluid Mechanics provides the basic concept of fluids and fluid flow which is essential for almost all engineering disciplines. This comprehensive and systematically organized book presents a thorough, concise and accurate discussion of the fundamentals and principles in fluid mechanics. It analyses the problems involving fluid flow using simple mathematical formulations to help students follow the methodologies for future work. Along with the fundamental principles, the book discusses in detail, the analysis of incompressible and compressible flows, dimensional analysis and similarity, measurements in fluid flow and hydraulic machinery.

The book is designed to serve as a textbook for undergraduate students of civil, mechanical, electrical and electronics, chemical and aeronautical engineering. The book will also be extremely useful for practising engineers.

**KEY FEATURES**

- Incorporates more than 275 illustrative examples
- Includes more than 500 simple diagrams illustrating basic principles and applications
- Review questions at the end of each chapter to drill students in self study
- Numerical problems and their answers to develop students' problem-solving approach

**Contents:**

Latest Print 2014 / 872 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4072-5 / ₹ 495.00 / (e-book also available)

**DAS**

**Fluid Mechanics and Turbomachines**

MADAN MOHAN DAS, formerly Professor, Department of Civil Engineering, Assam Engineering College, Guwahati.

Primarily designed as a text for the undergraduate students of aeronautical engineering, mechanical engineering, civil engineering, chemical engineering and other branches of applied science, this book provides a basic platform in fluid mechanics and turbomachines.

The book begins with a description of the fundamental concepts of fluid mechanics such as fluid properties, its static and dynamic pressures, buoyancy and floatation, and flow through pipes, orifices, mouthpieces, notches and weirs. Then, it introduces more complex topics like laminar flow and its application, turbulent flow, compressible flow, dimensional analysis and model investigations. Finally, the text elaborates on impact of jets and turbomachines like turbines, pumps and miscellaneous fluid machines.

**KEY FEATURES**

- Comprises twenty four methods of flow measurements.
- Presents derivations of equations in an easy-to-understand manner.
- Contains numerous solved numerical problems in S.I. units.
• Includes unsteady equations of continuity and dynamic equation of gradually varied flow in open channel.


MAJUMDAR
Fluid Mechanics (with Laboratory Manual)
BIRESWARR MAJUMDAR, Professor, Department of Power Engineering, Jadavpur University, Kolkata.

Primarily intended for the undergraduate students of mechanical engineering, civil engineering, chemical engineering and other branches of applied science, this book presents a comprehensive coverage of the basic laws of fluid mechanics. The text also discusses the solutions of fluid-flow problems that are modelled by differential equations. Emphasis is placed on formulating and solving typical problems of engineering practice.

The text introduces the principle of fluid mechanics in a well organized manner, beginning with the simple and proceeding to the complex. The aim of laboratory manual at the end of chapters is to teach the students, how to conduct experiments in fluid mechanics. It provides the step-wise details of experiments which include objective, theory of the experiment, apparatus used in the experiment, procedure, observations, and graphs to be plotted. Chapter-end exercises enable the students to recapture the topics discussed and drill them in the theory. Finally, the worked-out examples with solutions are useful to readers in comprehending the problems discussed. The summary and exercises provided at the end of each chapter enable the student to recapture the topics presented. The worked-out examples help the reader in comprehending the problems discussed. The book is a happy fusion of theory and applications and should prove to be an ideal text for undergraduate students of civil and mechanical engineering and as a ready reference for the first-level postgraduate students.


RAIKAR
Laboratory Manual—Hydraulics and Hydraulic Machines
R.V. RAJKAR, Professor of Civil Engineering and Dean, Planning, K.L.E. Society’s College of Engineering and Technology, Belgaum, Karnataka.

This manual presents 31 laboratory-tested experiments in hydraulics and hydraulic machines.

This manual is organized into two parts. The first part equips the student with the basics of fluid properties, flow properties, various flow measuring devices and fundamentals of hydraulic machines. The second part presents experiments to help students understand the basic concepts, the phenomenon of flow through pipes and flow through open channels, and the working
principles of hydraulic machines. For each experiment, the apparatus required for conducting the experiment, the probable experimental set-up, the theory behind the experiment, the experimental procedure, and the method of presenting the experimental data are all explained. Viva questions (with answers) are also given. In addition, the errors arising during recording of observations, and various precautions to be taken during experimentation are explained with each experiment.

The manual is primarily designed for the undergraduate degree students and diploma students of civil engineering, mechanical engineering and chemical engineering.


Latest Print 2013 / 336 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4593-5 / ₹ 275.00 / (e-book also available)

RATHAKRISHNAN
ETHIRAJAN RATHAKRISHNAN, Professor of Aerospace Engineering at the Indian Institute of Technology Kanpur.

The third edition of this easy-to-understand text continues to provide students with a sound understanding of the fundamental concepts of various physical phenomena of science of fluid mechanics. It adds a new chapter (Vortex Theory) which presents a vivid interpretation of vortex motions that are of fundamental importance in aerodynamics and in the performance of many other engineering devices. It elaborately explains the dynamics of vortex motion with the help of Helmholtz’s theorems and provides illustrations of how the manifestations of Helmholtz’s theorems can be observed in daily life.

Several new problems along with answers are added at the end of Chapter 4 on Boundary Layer.

The book is suitable for a one-semester course in fluid mechanics for undergraduate students of mechanical, aerospace, civil and chemical engineering students.

A Solutions Manual containing solutions to end-of-chapter problems is available for use by instructors.


Latest Print 2013 / 336 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4593-5 / ₹ 275.00 / (e-book also available)

SHESA PRAKASH
Experiments in Hydraulics and Hydraulic Machines: Theory and Procedures (with CD-ROM)
M.N. SHESA PRAKASH, Vice Principal and Professor of Civil Engineering, Vidyas institute of Engineering and Technology, Mysore.

Primarily intended for the Civil engineering students of all universities, this laboratory manual can be equally useful for the students of mechanical engineering as well. The manual comprises Flow side experiments (Experiment 1–Experiment 11) and Machine experiments (Experiment 12–Experiment 17).

Written in a very easy-to-understand language, each experiment of the book is arranged in step-by-step procedures, with adequate theory, and detailed apparatus and calculations needed to conduct it in a lab.

KEY FEATURES
• A record book comprising Tabular column and specimen calculations so that students can enter the values and compute the results directly on it.
• Students can plot the curve in the Graph sheets provided then and there as per the requirement or explanation.
• Viva Voce Questions (with Answers) are provided at the end of the book.


Latest Print 2011 / 152 pp. / 21.6 × 27.8 cm
ISBN-978-81-203-4184-5 / ₹ 195.00 / (e-book also available)

SINGH
Experiments in Fluid Mechanics, 2nd ed.
SARBJIT SINGH, Associate Professor of Civil Engineering at the Thapar University, Patiala.

This Second Edition contains 18 experiments in Fluid Mechanics, selected from the prescribed curriculum of various universities and institutes. The laboratory work in Fluid Mechanics is undertaken by the undergraduate engineering students of several branches such as
The first part of the book allows the students to review the fundamental theory before stepping into the laboratory environment. The second part enumerates the experimental set-ups, and provides a concluding discussion of each experiment. Appendix A gives various questions based on each experiment to test the student’s understanding of the learned material. Appendix B gives data on physical properties of water, air and some commonly used fluids in the laboratory, and also lists other standard data to be used in various experiments.


Foundation Engineering

SOM & DAS

Theory and Practice of Foundation Design

N.N. SOM, Professor of Civil Engineering, Jadavpur University, Kolkata.
S.C. DAS, Professor of Civil Engineering, Jadavpur University, Kolkata.

This comprehensive text on foundation design is intended to introduce students of civil engineering, architecture, and environmental disciplines to the fundamentals of designing sound foundations and their implementation. It offers an in-depth coverage of pre- and post-design methodologies that include soil identification, site investigation, interpretation of soil data and design parameters, foundations on different soil types through to settlements, seismic responses, and construction concerns.

Supported by the abundance of real-world events/situations and examples that help students master the text concepts, this volume becomes an incisive text and reference guide.


Latest Print 2013 / 392 pp. / 17.8 × 23.5 cm

VARGHESE

Design of Reinforced Concrete Foundations

P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

A companion volume to the author’s Foundation Engineering (published by PHI Learning), this comprehensive and well-organized text deals with the structural design of the commonly used types of reinforced concrete foundations. It explains step-by-step procedure for the design of each type of foundation with the help of a large number of worked-out examples. The book provides an in-depth analysis of topics, such as wall footings, balanced footings, raft foundations, beam and slab rafts, pile caps and pile foundations.

KEY FEATURES

• Explains IS Codes on the subject.
• Presentation of the book is lecture-based, with each chapter dealing with one topic. This helps the teachers in their lectures.
• Deals with modern concepts as well as empirical procedure.
• Devotes a separate chapter to the effects of earthquakes on foundations.
• Has a large number of diagrams to illustrate the concepts discussed.

The book is designed as a textbook for the undergraduate and postgraduate students (Structural/Geotechnical) of Civil Engineering. As the book deals with both the fundamentals of the subject and field practice, practising engineers will also find the book very useful.


Latest Print 2013 / 456 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3615-5 / ₹ 425.00 / (e-book also available)

VARGHESE
Foundation Engineering
P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

Foundation Engineering is of prime importance to undergraduate and postgraduate students of civil engineering as well as to practising engineers. For, there is no construction—be it buildings (government, commercial and residential), bridges, highways, or dams—that does not draw from the principles and application of this subject. Unlike many textbooks on Geotechnical Engineering that deal with both Soil Mechanics and Foundation Engineering, this text gives an exclusive treatment and an indepth analysis of Foundation Engineering.

What distinguishes the text is that it not merely equips the students with the necessary knowledge for the course and examination, but provides a solid foundation for further practice in their profession later. In addition, as the book is based on the Codes prescribed by the Bureau of Indian Standards, students of Indian universities will find it particularly useful.

The author is specialized in both Soil Mechanics and Structural Engineering; he studied Soil Mechanics under the guidance of Prof. Terzaghi and Prof. Casagrande of Harvard University—the pioneers of the subject. Similarly, he studied Structural Engineering under Prof. A.L.L. Baker of Imperial College, London, the pioneer of Limit State Design. These specializations coupled with over 50 years of teaching experience of the author make this text authoritative and exhaustive.

Intended as a text for undergraduate (Civil Engineering) and postgraduate (Geotechnical Engineering and Structural Engineering) students, the book would also be found highly useful to practising engineers and young academics teaching the course.

KEY FEATURES
- Provides a lecture-based discussion of each topic, i.e. each lecture topic is given in one chapter.
- Each chapter has worked-out problems to illustrate the concepts discussed.
- BIS Codes are referred wherever found necessary.
- Simplified thumb rules are included, which are of great help to the practising engineers.


Latest Print 2014 / 512 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2652-1 / ₹ 425.00 / (e-book also available)

Geographic Information Systems
CLARKE, PARKS & CRANE (Eds.)
Geographic Information Systems and Environmental Modeling
KEITH C. CLARKE, University of California, Santa Barbara.
BRADLEY O. PARKS, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder.
MICHAEL P. CRANE, United States Geological Survey, EROS Data Center, Sioux Falls.

This concise, contemporary book, which has contributions from several authors who have the experience and expertise in subjects dealt within the text, successfully integrates geographical information systems (GIS) and environmental models (EM). It is designed as a text for advanced courses in GIS/EM and for short-term courses in these subjects. The book begins with a disciplinary perspective of GIS/EM, explores modeling frameworks, paradigms and
approaches, and highlights the impact of the computer models, termed geocomputation. It then delineates in detail the consequences of integrating GIS and environmental models for decision making, time dimension in modeling, and gives methodological and practical examples of the importance of process modeling for physical systems.


Latest Print 2011 / 320 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2174-8 / ₹ 275.00

Advanced Soil Dynamics and Earthquake Engineering

Bharat Bhushan Prasad, Professor and Head, Department of Civil Engineering, Galgotias College of Engineering and Technology, Greater Noida.

This text presents the applications of soil dynamics and earthquake engineering for seismic-resistant design of foundations and earth-retaining structures. It is a sequel to the author’s book entitled Fundamentals of Soil Dynamics and Earthquake Engineering that presents the basic principles, whereas advanced topics have been covered in this text.

The book discusses topics such as the emerging challenges to seismic-resistant foundations and other soil-retaining structures, the practical issues of soil investigations for a specific project, the basic principles of vibrations along with their practical applications to civil engineering structures, the dynamic stability of elastic systems, the dynamic response to bomb blast loading and their effect on foundations and sub-structures, the dynamics of beam on elastic foundations, and the dynamics of foundations.

This textbook is essentially meant for undergraduate students in Civil Engineering and also covers the postgraduate course in Earthquake Engineering. The book will also be helpful as a ready reference for design and consulting engineers.

Content Index

Geotechnical Engineering

CODUTO, YEUNG & KITCH


DONALD P. CODUTO, California State Polytechnic University, Pomona.

MAN-CHU RONALD YEUNG, California State Polytechnic University, Pomona.

WILLIAM A. KITCH, California State Polytechnic University, Pomona.

This book offers a thorough, yet student-friendly, introduction to the field of geotechnical engineering. In this thoroughly updated new edition the authors have strengthened the coverage of “principles” to facilitate a better understanding of fundamental geotechnical engineering concepts. Primarily designed for undergraduate civil engineering students, this integrated approach gives students a broader perspective of the subject matter and provides a solid foundation for future studies. The material is reinforced with many example and end-of-chapter problems.


Latest Print 2014 / 816 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4155-5 / ₹ 525.00 (e-book also available)

Foundation Design in Practice

GHOSH

KARUNA MOY GHOSH, formerly Chief Structural Engineer with Kaiser Engineers and Constructors, Inc., and Mott MacDonald Group.

The behaviour of foundation is closely interlinked with the behaviour of soil supporting it. This book develops a clear understanding of the soil parameters, bearing capacity, settlement and deformation, and describes the practical methods of designing structural foundations.

The book analyses the various types of foundations, namely isolated footing, strip foundation and raft foundation, and their structural design. It discusses piled foundation, the types and behaviour of piles in various...
Soil mechanics


This book is suitable for the senior undergraduate students of civil engineering and postgraduate students specializing in geotechnical engineering. Besides, practising engineers will also find this book useful.


What is new to this edition:

• Makes the book accessible and interesting by logical organization and presentation of topics.
• Includes a large number of Objective Type Questions and Exercises.
• Analyzes field problems and case histories.
• Gives a large number of worked-out numerical examples.
• Makes the book accessible and interesting by logical organization and presentation of topics.
• All computer programs have been upgraded.
• Figures and explanations to facilitate professionals and designers of machine foundation to solve the complex problem of stability analysis
• Objective-type questions to aid in UPSC examinations

KEY FEATURES

• Demonstrates both BS codes of practice and Eurocodes to analyse soil and structural design of foundations and compares the results
• Includes a number of examples on foundations
• Provides structural design calculations with step-by-step procedures
• Gives sufficient numbers of relevant sketches, figures and tables to reinforce the concepts

This book consolidates on the subject, bringing in new areas of interest and concern.

This revised Third Edition is a result of the positive feedback and constructive suggestions received from academics and students alike on the second edition. It also reflects the many years of teaching experience of the author as also his experience in research and consultancy on the subject.

While retaining the major contents of the earlier editions, the book consolidates on the subject, bringing in new areas of interest and concern.

What is new to this edition:

• A new chapter covering various geotechnical aspects of Earthquakes.
• All computer programs have been upgraded.

This text, which skillfully integrates theory and practice, would be suitable as a textbook for undergraduate students of civil engineering. The book can also be used, by a judicious choice of topics, by polytechnic students. In addition, practising engineers would find the text very useful.

KEY FEATURES

• Includes numerical problems (with solutions) in connection with construction of dams and highways in hilly region
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• Analyzes field problems and case histories.
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Soil Mechanics and Foundation Engineering

UTSAV CHANDRA KALITA, Professor and Academic Director, Assam Down Town University, Guwahati.

Designed for the undergraduate students of civil engineering, this textbook covers the theoretical aspects of soil mechanics and foundation engineering in a single volume.

The text is organized in two parts—Part I (Soil mechanics) and Part II (Foundation engineering): Part I includes the basic properties and strength of soil, vertical and lateral pressures, discussion on earthen dam, sheet piles, and stability analysis for hill slope in connection with hill road construction. Part II discusses shallow and deep foundations, approaches of analysis of machine foundation, and various methods of determining the bearing capacity of soil. A separate chapter is devoted to on-site investigation.

Besides the undergraduate students, this compendium will also be useful for students appearing for various competitive examinations such as GATE, IES and IAS. Consulting engineers in geotechnical engineering may also use this book as a reference.

KEY FEATURES

• Demonstrates both BS codes of practice and Eurocodes to analyse soil and structural design of foundations and compares the results
• Includes a number of examples on foundations
• Provides structural design calculations with step-by-step procedures
• Gives sufficient numbers of relevant sketches, figures and tables to reinforce the concepts

This book is suitable for the senior undergraduate students of civil engineering and postgraduate students specializing in geotechnical engineering. Besides, practising engineers will also find this book useful.


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• Analyzes field problems and case histories.
• Makes the book accessible and interesting by logical organization and presentation of topics.

designing sound foundations and their implementation. It offers an in-depth coverage of pre- and post-design methodologies that include soil identification, site investigation, interpretation of soil data and design parameters, foundations on different soil types through to settlements, seismic responses, and construction concerns.

Supported by the abundance of real-world events/situations and examples that help students master the text concepts, this volume becomes an incisive text and reference guide.

Contents:
- Soil as an Engineering Material.
- Site Investigation.
- Soil Data and Design Parameters.
- Foundations: Types and Design Criteria.
- Stress Distribution in Soils.
- Bearing Capacity of Shallow Foundations.
- Settlement Analysis.
- Footings and Raft Design.
- Pile Foundations.
- Well Foundations.
- Foundations on Expansive Soils.
- Ground Improvement Techniques.
- Earthquake Response of Soils and Foundations.
- Construction Problems.

Hydraulic Engineering

DAS, et al.

Hydraulics and Hydraulic Machines

MADAN MOHAN DAS, has been Professor, Civil Engineering Department, Assam Engineering College, Guwahati. An Emeritus Fellow of AICTE, Director of Technical Education, Government of Assam and a Telford Premium.

MIMI DAS SAIKIA, Professor, Civil Engineering, Assam Downtown University, Guwahati. She has been a Lecturer with the Department of Civil Engineering, National Institute of Technology, Silchar, an Associate Professor, Civil Engineering, Royal School of Engineering and Technology (RSET), Guwahati and Professor, Regional Institute of Science and Technology (RIST), Meghalaya.

BHARGAB MOHAN DAS, Chief Business Development Officer, Ritta Co. Ltd., Thailand.

Intended as a textbook for the undergraduate students of civil and mechanical engineering, this book is the outcome of authors’ vast experience in this subject area. It presents the basic theories of hydraulics and all types of hydraulic machines that are used in these days in our day-to-day life.

Organized in two parts—Hydraulics (Part I) and Hydraulic Machines (Part II), the book is written in an easy-to-follow method in conformity to the syllabi followed in universities. The chapter end exercises of all the chapters are carefully prepared for the students, which enhance their problem-solving skills.

This book is also useful for the students of chemical, electrical and aeronautical engineering.
KEY FEATURES

- Copious well-illustrated figures
- Detailed description of various types of pumps and miscellaneous hydraulic machines
- Numerous solved problems and unsolved problems with answers
- Deductions and numerical examples in S.I. Units


Latest Print 2012 / 412 pp. / 17.8 × 23.5 cm

ISBN-978-81-203-4533-1 / ₹ 225.00 / (e-book also available)

Hydraulic Structures

GHOSH

Analysis and Design Practice of Hydraulic Concrete Structures

KARUNA MOY GHOSH, formerly Chief Structural Engineer in Kaiser Engineers, Inc., and also Matt MacDonald Group (UK), and W.S. Atkins & Partners (India).

This book provides students with a complete picture of how to apply the basic principles and techniques to the analysis and design of public utility hydraulic concrete structures that retain and contain aqueous liquid. It covers six types of structures of different functions. The book discusses the design philosophy of structures, related to functional aspects and selection of materials of construction, with reference to the relevant clauses of codes of practice prescribed in Eurocodes 2 and BS 8007 and 8110. To prevent ingress and leakage the importance of impermeability of concrete in the design and construction of hydraulic structures has been emphasized.

The book describes the design of underground tanks for treatment of sewage—a sedimentation tank and a circular digestion tank. The design parameters, dimensions, ground conditions for constructing a water reservoir to supply fresh potable water in rural districts are explained. In addition, the book illustrates the design of three more hydraulic structures, namely an immersed highway tunnel, a swimming pool and a gravity dam.

The book is intended for senior undergraduate students of civil engineering and postgraduate students specializing in structural design. It can also serve as a useful practical guide and an excellent reference for practising and consulting engineers involved in the design and execution of hydraulic concrete structures.


Latest Print 2011 / 144 pp. / 17.8 × 23.5 cm

ISBN-978-81-203-4383-2 / ₹ 195.00 / (e-book also available)
Introduction to Civil Engineering

RAIKAR

Elements of Civil Engineering and Engineering Mechanics

R.V. RAIKAR, Professor of Civil Engineering, K.L.E. Society's College of Engineering and Technology, Belgaum, Karnataka.

This book equips the students with the basic knowledge of certain facets of Civil Engineering and Engineering Mechanics as needed by them in the beginning of their engineering education. The book is primarily tailored to conform to the first-year B.Tech syllabus of Visvesvaraya Technological University (VTU). It will be useful for the students in other universities too.

The first part of the book discusses the fundamentals of civil engineering and the characteristics of some civil structures, such as buildings, roads, bridges, and dams. The second part deals with the topics of engineering mechanics that help in finding the solutions to problems of engineering. It deals with the systems of forces to which rigid bodies are subjected, centroids of plane figures, moment of inertia of some important geometrical figures, and the laws of friction. Worked-out examples, practice problems, and objective-type questions in each chapter are designed to reinforce the learning of the subject matter.


Latest Print 2011 / 452 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4097-8 / ₹ 195.00 / (e-book also available)

SHESHA PRAKASH & MOGAVEER

Elements of Civil Engineering and Engineering Mechanics, 3rd ed.

M.N. SHESHA PRAKASH, Vice Principal and Professor of Civil Engineering, Vidya Vikas Institute of Engineering and Technology, Mysore.
GANESH B. MOGAVEER, Professor and Head of Civil Engineering Department, Mangalore Institute of Technology and Engineering, Moodabidri.

This book, in its third edition, continues to focus on the basics of civil engineering and engineering mechanics to provide students with a balanced and cohesive study of the two areas (as needed by them in the beginning of their engineering education). A basic undergraduate textbook for the first-year students of all branches of engineering, this book is specifically designed to conform to the syllabus of Visvesvaraya Technological University (VTU).

Imparting the basic knowledge in various facets of civil engineering and the related engineering structures and infrastructure such as buildings, roads, highways, dams and bridges, the third edition covers the engineering mechanics portion in eleven chapters. Each chapter introduces the concepts to the reader, stepwise.
Providing a wealth of practice examples, the book emphasizes the importance of building strong analytical skills. Practice problems, at the end of each chapter, give students an opportunity to absorb concepts and hone their problem-solving skills.

The book comes with a companion CD containing the software developed using MS-Excel, to work out the problems on Forces, Centroid, Friction and Moment of Inertia. The use of this software will enable the students to understand the concepts in a relatively better way.

NEW TO THIS EDITION

- Introduces a chapter on Kinematics as per the revised Civil Engineering syllabus of VTU
- Updates with the latest examination Question Papers, including the one held in the month of December 2013

Contents:

Latest Print 2014 / 560 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-5001-4 / ₹ 395.00 / (e-book also available)

Maintenance

VARGHESE

Maintenance, Repair & Rehabilitation and Minor Works of Buildings

P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

The term Maintenance of a building refers to the work done for keeping an existing building in a condition where it can perform its intended functions. Usually, the buildings last only for 40 to 50 years in a good shape just because of regular inspection and maintenance that enable timely identification of deteriorated elements. Overlooked dilapidation, inadequate maintenance and lack of repair work may lead to limited life span of a building. This comprehensive book, striving to focus on the maintenance, repair & rehabilitation and minor works of a building, presents useful guidelines that acquaint the readers with the traditional as well as modern techniques for upkeeping and repairing of buildings already constructed.

Dexterously organised into five parts, this book in Part I deals with the maintenance of buildings. Description of the construction chemicals, concrete repair chemicals, special materials used for repair, and repair of various parts of a building is given in Part II. Strengthening of reinforced concrete members by shoring, underpinning, plate bonding, RC jacketing and FRP methods are explored in Part III, which also highlights rebuilding of RC slabs and protection of earth slopes. Part IV of the book exposes the reader to the minor works done in a building such as construction of compound walls, gates, waters sumps, house garage, relaying of floors, joining two adjacent rooms and so on. Part V is based on some allied topics involving control on termites and fungus in buildings as well as introduction of Vaastu Shastra and its main recommendations for a single house in a plot.

Using an engaging style, this book will prove to be a must-read for the undergraduate and postgraduate students of civil engineering as well as for the polytechnic and ITI diploma students. Besides, the book will also be of immense benefit to the technical professionals across the country.

KEY FEATURES

- The text displays several figures to make the concepts clear.
- Chapter-end references make the text suitable for further study.
- Appendices at the end of the text provide extra information on non-destructive field tests for survey of the condition of concrete buildings and rough estimation of the construction and maintenance costs of buildings.


Last Print 2014 / 256 pp. / 17.8 × 23.5 cm

Reinforced Concrete Technology

GAMBHIR
Design of Reinforced Concrete Structures

M.L. GAMBHIR, former Professor and Head of Civil Engineering Department, and Dean (Planning and Resource Generation) at the Thapar Institute of Engineering and Technology, Patiala.

Designed primarily as a text for undergraduate students of civil engineering, this compact and well-organized text presents all the basic topics of reinforced concrete design in a comprehensive manner. The text conforms to the limit states design method as given in the latest revision of Indian Code of Practice for Plain and Reinforced Concrete, IS: 456 (2000). This book covers the applications of design concepts and provides a wealth of state-of-the-art information on design aspects of wide variety of reinforced concrete structures. However, the emphasis is on modern design approach. The text attempts to:

- Present simple, efficient and systematic procedures for evolving design of concrete structures.
- Make available a large amount of field tested practical data in the appendices.
- Provide time saving analysis and design aids in the form of tables and charts.
- Cover a large number of worked-out practical design examples and problems in each chapter.
- Emphasize on development of structural sense needed for proper detailing of steel for integrated action in various parts of the structure.

Besides students, practising engineers and architects would find this text extremely useful.


Last Print 2013 / 740 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3193-8 / ₹ 475.00 / (e-book also available)

GAMBHIR
Fundamentals of Reinforced Concrete Design

M.L. GAMBHIR, former Professor and Head of Civil Engineering Department, and Dean (Planning and Resource Generation) at the Thapar Institute of Engineering and Technology, Patiala.

First six chapters deal with fundamentals of limit states design of reinforced concrete. The objective of last two chapters (including design aids in appendix) is to initiate the readers in practical design of concrete structures. The text gives detailed discussion of basic concepts, behaviour of the various structural components under loads, and development of fundamental expressions for analysis and design. It also presents efficient and systematic procedures for solving design problems. In addition to the discussion of basis for design calculations, a large number of worked-out practical design examples based on the current design practices have been included to illustrate the basic principles of reinforced concrete design. Besides students, practising engineers would find this text extremely useful.

MAJOR TOPICS DISCUSSED ARE

- Practical Design of Key Building Elements: Design of singly and doubly reinforced rectangular and flanged beams, lintel, continuous beam, one-way and two-way slabs, staircases; short and slender columns subjected to axial load, uni-axial and biaxial bending moments; reinforced concrete walls; members in direct tension, and members subjected to bending and direct tension; spread footings for walls, isolated or independent footings for columns; Basement wall.

- Practical Detailing the Reinforcement: Detailing of slabs, beams, off-set columns, joints; Detailing the member with a change in direction, edge beams, support points, corners of wall; Beams or girders intersection joints [Grid-joints]; Beams and column joints (Rigid-frame joints); Corner joints; Exteror and interior joints.
• Design Aids: Maximum positive and negative bending moments, and reactions in multi-span continuous-beams; Moment resisting capacity of singly reinforced rectangular beams; Design of singly reinforced rectangular beam for the given ultimate moment; Values of $p_i$ and $p_v$ for the doubly reinforced rectangular beam sections for the given $M_{lbd}$; Spacing of two-legged stirrups for given value of shear per unit depth; Design column interaction diagrams.

• Steel Properties: Area of group of reinforcing standard bars; Number of standard reinforcing bars for the given area; Areas of bars in reinforcement mesh, e.g., slab reinforcement; Perimeter of group of reinforcing bars; Area, perimeter, mass and mass of steel for specified spacing of bars.

DISTINGUISHING FEATURES
• Provides a large number of clear cut diagrams.
• Includes Review questions and Tutorial problems at the end of each chapter.
• Gives time saving analysis and design aids in the form of tables and charts.
• Emphasizes on clarity of concepts and development of structural sense needed for proper detailing.
• Covers working stress design method in the appendix.

Contents:

Latest Print 2014 / 532 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3048-1 / ₹ 395.00 / (e-book also available)

GHOSH
Practical Design of Reinforced Concrete Structures
KARUNA MOY GHOSH, formerly Chief Structural Engineer with Kaiser Engineers and Constructors, Inc., and Matt MacDonald Group.

This book is a comprehensive presentation of the practical aspects of analysis and design of reinforced concrete structures. Written on the basis of the British (BS) and European (Eurocode) codes of practice, this book is primarily meant for the undergraduate students of civil engineering. It will also be highly useful for structural engineers working in the fields of design, consultancy and construction involving reinforced concrete structures.

The text is organized into four parts, each dealing with the analysis and design of a specific type of reinforced concrete structure. The first part covers the multi-storeyed administrative/office building. The second part deals with the elevated storage bin structure used in steel plants. The elevated structural framework subjected to mechanical vibration is the subject matter of the third part. The fourth and final part discusses the precast reinforced concrete workshop building. The important activities required to be carried out prior to structural analysis—structural arrangement planning, materials selection, examination of buildability and environmental impact—are covered in the initial chapters in each part. This is followed by a step-by-step presentation of the analysis and design procedures for various structures and structural elements/members.

The book presents the various structural analyses and design calculations in an exhaustive manner. The text is illustrated with a large number of visuals. Important additional information relevant to this field can be found in the references provided at the end of various chapters. The STRAP structural analysis program for the multi-storeyed administrative/office building, and the vibration analysis of the elevated reinforced concrete framed structure, are provided in the Annexures to the book.


Latest Print 2013 / 276 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4028-2 / ₹ 250.00 / (e-book also available)

VARGHESE
Advanced Reinforced Concrete Design, 2nd ed.
P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

Intended as a companion volume to the author’s Limit State Design of Reinforced Concrete (published by PHI Learning), the Second Edition of this comprehensive and systematically organized text builds on the strength of the first edition, continuing to provide a clear and
masterly exposition of the fundamentals of the theory of concrete design. The text meets the twin objective of catering to the needs of the postgraduate students of Civil Engineering and the needs of the practising civil engineers as it focuses also on the practices followed by the industry.

This text, along with Limit State Design, covers the entire design practice of revised Code IS456 (2000). In addition, it analyzes the procedures specified in many other BIS codes such as those on winds, earthquakes, and ductile detailing.

WHAT'S NEW TO THIS EDITION

• Chapter 18 on Earthquake Forces and Structural Response of framed buildings has been completely revised and updated so as to conform to the latest I.S. Codes 1893 (2002) entitled Criteria for Earthquake Resistant Design of Structures (Part I – Fifth Revision).
• Chapters 19 and 21 which too deal with earthquake design have been revised.
• A Summary of elementary design of reinforced concrete members is added as Appendix.
• Valuable tables and charts are presented to help students and practising designers to arrive at a speedy estimate of the steel requirements in slabs, beams, columns and footings of ordinary buildings.

DISTINGUISHING FEATURES

• Presents codes of other countries, especially of USA and UK, and these are compared with the Indian Code, thus exposing the reader to international practices.
• Gives a large number of worked-out examples to illustrate the theory and to demonstrate their use in practical designs.
• Contains a number of typical detailing of reinforced concrete members, which will be of great help in field applications.
• Lecture based presentation with each chapter dealing with one lecture topic.

Eminently suitable as a text for postgraduate students, the book can be used by a judicious choices of topics, also for elective undergraduate courses. The practising engineers too would treasure it as a companion reference and as a reference for the practicing engineers. Besides covering IS 456 : 2000, the book also deals with the British and US Codes. Advanced topics of IS 456 : 2000 have been discussed in the companion volume Advanced Reinforced Concrete Design (also published by Prentice-Hall of India). The two books together cover all the topics in IS 456 : 2000 and many other topics which are so important in modern methods of design of reinforced concrete.

The systems for underground excavations. Foundations of structures, including dams and support laboratory and field tests, stability of rock slopes, stereographic projection, in situ stress measurements, interpretation of geological mapping of joints through of rocks and rock masses, their classifications, a wide range of topics related to engineering behaviour multidimensional aspects of the subject. The text covers rock engineering, gives an in-depth analysis of the with expertise and vast experience in various areas of practising engineers and engineering geologists. This book, with contributions from a number of authors suitably for short courses conducted for teachers, and geophysics students. In addition, the book is material presented in this book is also taught to geology engineering and mining engineers. Though some contents of this vast subject mass is essential for civil engineers, engineering petroleum exploration and nuclear repositories, a more comprehensive and updated understanding of rock should be included for adoption in numerical analyses. When dilatancy component is separated, the scale effect on shear response is insignificant. This edition provides a comprehensive understanding of rock mass response and enables students to tackle rock engineering problems more confidently and realistically, and therefore it will be of immense benefit to students, teachers, professionals and designers alike.


**Rock Mechanics**

**RAMAMURTHY (Ed.)**

**Engineering in Rocks for Slopes, Foundations and Tunnels, 3rd ed.**

**Editor:** T. RAMAMURTHY, former Professor of civil engineering, served and taught at the Indian Institute of Technology (IIT) Delhi.

With the ever-increasing developmental activities as diverse as the construction of dams, roads, tunnels, underground powerhouses and storage facilities, petroleum exploration and nuclear repositories, a more comprehensive and updated understanding of rock mass is essential for civil engineers, engineering geologists, geophysicists, and petroleum and mining engineers. Though some contents of this vast subject are included in undergraduate curriculum, there are full-fledged courses on Rock Mechanics/Rock Engineering in postgraduate programmes in civil engineering and mining engineering. Much of the material presented in this book is also taught to geology and geophysics students. In addition, the book is suitable for short courses conducted for teachers, practising engineers and engineering geologists.

This book, with contributions from a number of authors with expertise and vast experience in various areas of rock engineering, gives an in-depth analysis of the multidimensional aspects of the subject. The text covers a wide range of topics related to engineering behaviour of rocks and rock masses, their classifications, interpretation of geological mapping of joints through stereographic projection, in situ stress measurements, laboratory and field tests, stability of rock slopes, foundations of structures, including dams and support systems for underground excavations.

The Third Edition of the book is further enriched with the addition of a number of case histories in which the analyses and designs were carried out by adopting rock mass parameters as per RMR, Q or GSI. The consequence of such an approach is critically examined. With the adoption of parameters from joint factor, excellent performance prediction has been demonstrated for anisotropic rocks and tunnel. Various expressions developed for $k_s$ and $k_f$ for different conditions are included for adoption in numerical analyses. When dilatancy component is separated, the scale effect on shear response is insignificant. This edition provides a comprehensive understanding of rock mass response and enables students to tackle rock engineering problems more confidently and realistically, and therefore it will be of immense benefit to students, teachers, professionals and designers alike.

**Latest Print 2013 / 580 pp. / 17.8 × 23.5 cm**

ISBN-978-81-203-2039-0 / ₹ 350.00 / (e-book also available)
Solid Waste Management

SASIKUMAR & GOPI KRISHNA
Solid Waste Management
K. SASIKUMAR, Professor and Head, Department of Commerce, University of Kerala, Thiruvananthapuram.
SANOO GOPI KRISHNA is Environmental Engineering Consultant. Earlier, he worked with the Kerala State Pollution Control Board.

Safe and effective management of solid waste generated by the community and governmental as well as commercial institutions is the need of the hour. This compact book describes how to avoid, minimize and manage solid waste and discusses models which, if implemented, can solve many of the current solid waste problems.

The text discusses the various sources of waste generation, composition of solid waste and the need for designing a strategic plan for solid waste management. It explains the importance of public involvement, and public awareness in managing solid waste besides giving an account of solid waste management hierarchy. In addition, the text describes in detail factors to be considered while developing a waste management programme, techniques for the recovery, reuse or recycling of solid waste, techniques of composting, and how to manage special wastes such as bio-medical waste, plastic, and e-waste. Case Studies of selected municipal corporations lend a practical flavour to the book.

The book is intended as a text for B.Tech. (Civil/Chemical Engineering) and M.Tech. (Civil/Environment Engineering, Environmental Science). Besides, it will be quite handy for consultants in solid waste management, environmental engineers, and municipal corporations.


Latest Print 2014 / 308 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4937-7 / ₹ 350.00 / (e-book also available)

Steel Structures

GHOSH
Analysis and Design Practice of Steel Structures, 2nd ed.
KARUNA MOY GHOSH, formerly Chief Structural Engineer, Kaiser Engineers and Constructors, Inc. and also with Matt MacDonald Group (London) and W.S. Atkins and Partners (India).

This book is a comprehensive presentation of the fundamental aspects of analysis and design of steel structures. It is primarily meant for the undergraduate students of civil engineering and postgraduate students of structural engineering. It will also be immensely useful for structural engineers engaged in design, consultancy and construction involving steel structures.

The important theoretical and practical concepts which need to be assimilated prior to undertaking analysis and design—general principles and practices, functional aspects of structures, basic design concepts, alternative arrangements of equipment and service, clarity of structural behaviour, and calculations of loadings on structures—are covered in the first two chapters. The ensuing chapters provide stepwise presentation of the analysis and design procedures for various steel structures and structural elements/members on the basis of Eurocodes and British (BS) codes of practice. The three types of structures specifically covered, on the basis of functional aspects, are scrap yard structures, conveyor structural systems, and turbo-generator buildings.

In the Second Edition, analysis and design of steel structures have been carried out based on Indian Standard code of practice IS 800:2007. Every component of the structure comprising the beams and columns is designed in compliance with the code IS 800:2007. A comparison has been made between the results of the steel structures analysed and designed in compliance with EC3: Part 1-1 and those obtained in accordance with Indian Standard code of practice IS 800:2007.

The book discusses the various structural analyses and design calculations in an exhaustive manner. The text is illustrated with an abundant number of visuals. Important sources of information relevant to steel structures can be found in the references at the end of various chapters.


Latest Print 2014 / 312 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4937-7 / ₹ 350.00 / (e-book also available)

SHIYEKAR
Limit State Design in Structural Steel, 2nd ed.
M.R. SHIYEKAR, former Principal and Professor in Structural Engineering, Pune.

The second edition has incorporated all the revisions necessitated after the issue of Amendment No. 1 of January 2012 to IS 800:2007.

The book is primarily designed for the students of civil/structural engineering at all levels of studies—
undergraduate, postgraduate and diploma—as well as for the professionals in the field of structural steel design. It covers the fundamental concepts of steel design in the perspective of the limit state design concept as per IS 800:2007, with the focus on cost-effective design of industrial structures, foot bridges, portal frames, and pressure vessels. The book features clear explanations, a wealth of worked-out examples of practical applications, and challenging problems.

The book covers the subject matter, with the help of numerous practical illustrations accompanied by step-by-step design calculations and detailing, in 14 chapters—including a chapter on pre-engineered buildings.

Solved examples as well as exercises are provided in each chapter to enable the development of a strong understanding of the underlying concepts and for testing the comprehension acquired by the students. The geometrical properties of rolled steel sections, often required as per the revised clauses of IS 800:2007 and not appearing in the existing steel tables, are given in the Appendix A for ready reference.


Latest Print 2013 / 420 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4784-7 / ₹ 450.00 / (e-book also available)

Strength of Materials/Mechanics of Solids/Mechanics of Materials

CHANDRAMOULI
Fundamentals of Strength of Materials

P.N. CHANDRAMOULI, Professor of Civil Engineering at the National Institute of Engineering, Mysore.

This book provides comprehensive coverage of the fundamental concepts and all the key topics of interest in Strength of Materials with an emphasis on solving practical problems, from the first principles, related to the design of structural members, mechanical devices and systems in several fields of engineering.

The book is organized to present a thorough treatment of stress analysis first. This treatment of basic principles is followed by appropriate application of analysis techniques and design approaches to trusses and cables, torsion in circular shaft, deflection of beams, buckling of straight columns and struts, and analysis of thick- and thin-walled cylinders under internal and external pressure.

The book features clear explanations, a wealth of excellent worked-out examples of practical applications, and challenging problems. The book is intended for the undergraduate students of civil, mechanical, electrical, chemical, aeronautical, and production and industrial engineering.

KEY FEATURES

• Provides a large number of worked-out examples to help students comprehend the concepts with ease.
• Gives chapter-end review questions to test students’ understanding of the subject.
• Includes chapter-end numerical problems to enhance the problem-solving ability of students. Many of the problems depict realistic situations encountered in engineering practice.
• Incorporates objective type questions to help students assess their overall mastery of the subject.


Latest Print 2013 / 864 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4672-7 / ₹ 525.00 / (e-book also available)

GAMBIHR
Fundamentals of Solid Mechanics
(A Treatise on Strength of Materials)

M.L. GAMBIHR, former Professor and Head, Department of Civil Engineering, and also Dean, Planning and Resource Generation, at the Thapar University, Patiala.

This book is primarily designed for courses in Solid Mechanics/Mechanics of Materials/Mechanics of Solids/Strength of Materials prescribed for the undergraduate students of engineering in civil, mechanical, aeronautical and applied mechanics disciplines. It covers all the basic topics of mechanics of deformable bodies generally taught in these courses.

The text presents the topics in a clear, simple, practical, logical and cogent fashion that provides the students with insights into theory as well as applications to practical problems. It uses an abundance of worked examples to impart a high level of comprehension of concepts and helps master the process of calculations, manipulations and that of making appropriate inferences. Well-labelled diagrams have been used throughout the text for a sound comprehension of the fundamentals of the subject. Most of the examples and chapter-end problems have been formulated in parametric form making them independent of units and suitable for practical applications. An extensive set of problems along with hints and answers is provided at the end of each chapter for practice.

Since the book aims at covering the topics generally taught in engineering curriculum of several disciplines, an interdisciplinary approach has been followed. Some advanced topics such as thick pressure vessels, skew bending, curved members, beam-columns, etc. have also been included for the benefit of postgraduate students.

Latest Print 2014 / 936 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3870-8 / ₹ 550.00 / (e-book also available)

SHESHA PRAKASH & SURESH
Textbook of Mechanics of Materials
(with CD-ROM)
M.N. SHESHA PRAKASH, Vice Principal and Professor of Civil Engineering, Vidya Vikas Institute of Engineering and Technology, Mysore.
G.S. SURESH, Professor and Head, Department of Civil Engineering, National Institute of Engineering (NIE), Mysore.

Primarily designed as a textbook for the undergraduate students of civil engineering and mechanical engineering, this compact and accessible book covers the fundamental principles and applications of Strength of Materials/ Mechanics of Materials. The text discusses in detail the topics such as simple and compound stresses, bending moments, shear forces, stresses in beams, deflection in beams, torsion of shafts, thick and thin cylinders, and columns and struts. A large number of worked-out problems are provided to illustrate the concepts discussed. Besides, a large number of chapter-end problems are given to help students test their understanding of the subject.

This book comes with a companion CD containing software, developed using MS Excel, to work out the problems. It would help the faculty to develop new kinds of problems with reliable solutions for use in tests and examinations. The use of this software will enable the students to understand the concepts in a thorough manner.


Latest Print 2011 / 304 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4185-2 / ₹ 275.00 / (e-book also available)

SINGH
Mechanics of Solids
ARBIND KUMAR SINGH, Department of Civil Engineering, Indian Institute of Technology Guwahati.

Designed as a text for both the undergraduate and postgraduate students of civil, mechanical, aerospace, and marine engineering, this book provides an indepth analysis of the fundamental principles of mechanics of deformable solids based on the phenomenological approach.

The book starts with linear and angular momentum principles for a body. It introduces the concepts of stress, strain and the constitutive relations using tensors. Then it goes on to give a description of the laws of thermodynamics as a restriction on constitutive relations and formulates the boundary value problem in elasticity. Besides, the text treats bar under axial, bending and torsional deformation as well as plane stress and plane strain idealizations. The book concludes with a discussion on variational mechanics and the theory of plasticity.

DISTINGUISHING FEATURES

- Elaborate treatment of constitutive relations for linear elasticity.
- Consistent formulation of strength of materials approach and three-dimensional elasticity for bar under axial, bending and torsional deformation.
- Presentation of failure criteria and plasticity theory taking the modern developments into account.
- Large number of worked-out examples throughout the text and exercises at the end of each chapter.


Latest Print 2014 / 496 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3190-7 / ₹ 395.00 / (e-book also available)

SRIVASTAVA & GOPE
Strength of Materials, 2nd ed.
A.K. SRIVASTAVA, Manager (Design) in Aircraft Upgrade Research and Design Centre, Hindustan Aeronautics Limited (Ministry of Defence), Nasik.
P.C. GOPE, Professor in Mechanical Engineering at the College of Technology, G.B. Pant University of Agriculture and Technology, Pantnagar.

The book, now in the Second Edition, presents the fundamental principles of strength of materials and focuses on 3D analysis of stress and strain, double integration method, Macaulay's method, moment area method and method for determining stresses using Winkler-Bach theory. It also covers the analyses of helical
springs and leaf spring, and buckling analysis of columns and struts using Euler’s and Rankine’s theory.

This edition includes four new chapters, namely Simple and Compound Stress, Theory of Failure, Energy Methods and Finite Element Method and its Applications Using ANSYS Software. The chapter on Analysis of Stress and Strain has been thoroughly revised.

The text is primarily designed for the undergraduate students of mechanical engineering, production engineering, and industrial engineering. Besides students, practising engineers would also find the book useful.

**KEY FEATURES**

- A large number of numerical problems
- Open-ended or synthesis-type examples wherever required
- Chapter-end exercises


**Latest Print 2014 / 352 pp. / 17.8 × 23.5 cm**

ISBN-978-81-203-4309-2 / ₹ 350.00 (e-book also available)

**GAMBHIR Fundamentals of Structural Mechanics and Analysis**

M.L. GAMBHIR, has been Professor and Head of Civil Engineering Department, and Dean of Planning and Resource Generation, at Thapar University, Patiala.

This book is a comprehensive presentation of the fundamental aspects of structural mechanics and analysis. It aims to help develop in the students the ability to analyze structures in a simple and logical manner. The major thrust in this book is on energy principles.

The text, organized into sixteen chapters, covers the entire syllabus of structural analysis usually prescribed in the undergraduate level civil engineering programme and covered in two courses. The first eight chapters deal with the basic techniques for analysis, based on classical methods, of common determinate structural elements and simple structures. The following eight chapters cover the procedures for analysis of indeterminate structures, with emphasis on the use of modern matrix methods such as flexibility and stiffness methods, including the finite element techniques.

Primarily designed as a textbook for undergraduate students of civil engineering, the book will also prove immensely useful for professionals engaged in structural design and engineering.

**KEY FEATURES**

- More than 200 worked out examples illustrating the basic principles and solution techniques help students assimilate the underlying principles.
- More than 300 chapter-end exercises, with answers in many cases, test the students’ grasp of the fundamental concepts.
- Numerous well-labelled diagrams provided throughout the book lead to easy learning.
- Important additional materials in the appendices allow quick reference by the readers.

GODBOLE, SONPAROTE & DHOTE
Matrix Methods of Structural Analysis

P.N. GODBOLE, Professor Emeritus at RCOEM Nagpur.  
R.S. SONPAROTE, Associate Professor, Department of Applied Mechanics, Visvesvaraya National Institute of Technology (VNIT), Nagpur.  
S.U. DHOTE, Assistant Professor, Department of Civil Engineering, Yeshwantrao Chavan College of Engineering (YCCE), Nagpur.

The book describes in great detail the Matrix Methods of Structural Analysis used extensively for the analysis of skeletal or framed structures. The book gives complete coverage to the subject starting from the basics. It is organized in four parts:

- **Part 1** contains basic knowledge required to understand the subject i.e. Matrix operations, Methods for solving equations and concepts of flexibility matrix and stiffness matrix methods.

- **Part 2** deals with the applications of stiffness and flexibility matrix methods using system approach. By taking simple examples, the steps involved in both the methods are discussed and it is concluded why stiffness matrix method is more suitable for analysis of skeletal structures.

- **Part 3** covers the Stiffness matrix (displacement) method with member approach (direct Stiffness method) which is extensively used in the analysis of framed structures. It gives the details of the method, the steps involved in the method and its application to plane truss, space truss, beams, plane and space frames and grids.

- **Part 4** includes a unified computer program written in FORTRAN/C for the analysis of framed structure. The development of computer program, explanation of various subroutines, input output formats with examples is given in this section. An accompanying CD with the book contains source code, explanation of INPUT/OUTPUT and test examples.

Though, the concepts have been presented in quite general form so that the book serves as a learning aid for students with different educational backgrounds as well as the practicing engineers, the primary objective is to present the subject matter in a simple manner so that the book can serve as a basic learning tool for undergraduate and postgraduate students of civil engineering.


**NATARAJAN & REVATHI
Matrix Methods of Structural Analysis: Theory and Problems**

C. NATARAJAN, Professor, Department of Civil Engineering, National Institute of Technology, Tiruchirappalli.  
P. REVATHI, Assistant Professor, Department of Civil Engineering, Pondicherry Engineering College, Puducherry.

Designed as a textbook for the undergraduate students of civil engineering and postgraduate students of structural engineering, this comprehensive book presents the fundamental aspects of matrix analysis of structures. The basic features of Matrix Structural Analysis along with its intricacies in application to actual problems backed up by numerical examples, form the main objective of writing this book.

The text begins with the chapters on basics of matrices and structural systems. After providing the foundation for matrix structural representation, the text moves onto dimensional and behavioral aspects of structural systems to classify into pin-jointed systems, then onto beams and finally three-dimensional rigid jointed systems. The text concludes with a chapter on special techniques in using matrices for structural analysis. Besides, MATLAB codes are given at the end to illustrate interfacing with standard computing tool. A large number of numerical examples are given in each chapter which will reinforce the understanding of the subject matter.

RAJASEKARAN & SANKARASUBRAMANIAN
Computational Structural Mechanics
(with CD-ROM)
S. RAJASEKARAN, Professor Emeritus.
G. SANKARASUBRAMANIAN, Assistant Professor, both of Department of Civil Engineering, PSG College of Technology, Coimbatore.
This class-room tested book, representing the teaching experience of over two decades by the authors, is designed to cater to the needs of senior undergraduate and first-year postgraduate students of civil engineering for a course in Advanced Structural Analysis/Matrix Methods of Structural Analysis/Computer Methods of Structural Analysis.
The book endeavours to fulfil two principal objectives. First, it acquaints students with the matrix methods of structural analysis and their underlying concepts and principles. Second, it demonstrates the development of well-structured computer programs for the analysis of structures by the matrix methods.
A large number of worked-out examples are included to amplify the concepts and to illustrate the effect of external loads, including the effect of temperature, lack of fit, and settlement of supports, etc. The CD-ROM contains many illustrative computer programs and the usage of modern packages such as Excel and Matlab.
The book will also be a useful reference for practising structural engineers who wish to pursue the versatility of matrix methods as a tool for computer applications.
Latest Print 2014 / 564 pp. / 21.6 × 27.8 cm
ISBN-978-81-203-4869-1 / ₹ 595.00

SCHODEK & BECHTHOLD
Structures, 7th ed.
DANIEL L. SCHODEK.
MARTIN BECHTHOLD, Harvard University.
This book offers single-volume coverage of all major topics in structural analysis and design. Focusing on how structures really work, the text discusses concepts from both engineering and architectural perspectives, exploring structural behavior, structural analysis, and design within a building context.
The book helps students make a stronger connection between structural analysis and design concepts and their application to the real world of building structures.
It is suitable for courses in Structures or Structural Analysis and Design.
New to This Edition
• Expanded! Load and resistant factor design approaches are now explained more in depth, and have been included in the coverage of detailed design approaches for steel and timber beams and columns.
• Expanded and Updated! The coverage of structural system design has been expanded and revised.
• Streamlined! All construction and system integration topics have been consolidated.
• New! The impact of structural system choices on architectural space and form has been illustrated through many axonometric and perspective views inspired in part by Heino Engel’s illustration concepts.
• New! A number of new examples of actual building structures will enable students to make a better connection between the theory of structures and its actual application to design.
Latest Print 2012 / 796 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-1734-5 / ₹ 450.00

SHRIKHANDE
Finite Element Method and Computational Structural Dynamics
(with DVD)
MANISH SHRIKHANDE, Professor at Department of Earthquake Engineering, Indian Institute of Technology Roorkee, and a member of Indian Society of Earthquake Technology & Earthquake Engineering Research Institute.
Primarily intended for senior undergraduate and postgraduate students of civil, mechanical and aerospace/aeronautical engineering, this text emphasises the importance of reliability in engineering computations and understanding the process of computer aided engineering.
Written with a view to promote the correct use of finite element technology and to present a detailed study of a set of essential computational tools for the practice of structural dynamics, this book is a ready-reckoner for an in-depth discussion of finite element theory and estimation and control of errors in computations. It is specifically aimed at the audience with interest in vibrations and stress analysis. Several worked out
examples and exercise problems have been included to describe the various aspects of finite element theory and modelling. The exercise on error analysis will be extremely helpful in grasping the essence of posteriori error analysis and mesh refinement.

**KEY FEATURES**

- Thorough discussion of numerical algorithms for reliable and efficient computation.
- Ready-to-use finite element system and other scientific applications.
- Tips for improving the quality of finite element solutions.
- Companion DVD containing ready to use finite element applications.


Latest Print 2014 / 484 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4995-7 / ₹ 550.00 / (e-book also available)

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**Structural Dynamics and Earthquake Engineering**

**AGARWAL & SHRIKHANDE**

**Earthquake Resistant Design of Structures**

PANKAJ AGARWAL, Assistant Professor at the Department of Earthquake Engineering, Indian Institute of Technology Roorkee.

MANISH SHRIKHANDE, Professor at Department of Earthquake Engineering, Indian Institute of Technology Roorkee, and a member of Indian Society of Earthquake Technology & Earthquake Engineering Research Institute.

This comprehensive and well-organized book presents the concepts and principles of earthquake resistant design of structures in an easy-to-read style. The use of these principles helps in the implementation of seismic design practice. The book adopts a step-by-step approach, starting from the fundamentals of structural dynamics to application of seismic codes in analysis and design of structures. The text also focuses on seismic evaluation and retrofitting of reinforced concrete and masonry buildings. The text has been enriched with a large number of diagrams and solved problems to reinforce the understanding of the concepts.

Intended mainly as a text for undergraduate and postgraduate students of civil engineering, this text would also be of considerable benefit to practising engineers, architects, field engineers and teachers in the field of earthquake resistant design of structures.


Latest Print 2014 / 660 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2892-1 / ₹ 450.00 / (e-book also available)
DAMODARASAMY & KAVITHA
Basics of Structural Dynamics and Aseismic Design

S.R. DAMODARASAMY, Principal of Government College of Engineering, Salem.
S. KAVITHA, Assistant Engineer in the Highways Department, Government of Tamil Nadu, Erode.

This book covers all the four major areas of Earthquake Engineering such as Structural Dynamics, Seismology, Seismic Analysis, Aseismic Design, including design philosophy, capacity design and codal provisions. It also provides detailed information on liquefaction of soil and effects of soil properties on response spectra. Each chapter is well-designed and well-balanced with lucid illustrations and diagrams. Numerous solved examples have been included for better comprehension of the concepts. Exercises with answers have been provided at the end of each chapter to develop problem-solving skills of the students.

This comprehensive survey of the effects of earthquakes on dynamics of structures and their aseismic design is intended for B.E./B. Tech. students of Civil Engineering and M.E./M. Tech. students of Structural Engineering.

SALIENT FEATURES

• The concepts and theories of earthquake engineering are presented in a lucid manner, with ample discussions and numerous examples.

• Solved examples in each chapter illustrate the fundamental concepts and provide pedagogical reinforcement to ensure student comprehension.

• Incorporates necessary codal provisions such as IS 1893:2002, IS 13920:1993 and IS 4326:1976 for Seismic Analysis and Aseismic Design.

• Seismic Analysis and Aseismic Design of a five-storey RC frame is specially emphasized.

• Highlights the various new techniques in the field of earthquake engineering.


Latest Print 2014 / 336 pp. / 17.8 x 23.5 cm ISBN-978-81-203-3843-2 / (e-book also available)

Surveying

RAO & VIJAYALAKSHMI
Textbook of Surveying

P. VENUGOPALA RAO, Former Faculty JNTU, and Visiting Faculty and Advisor to various Private Engineering Colleges, Hyderabad.
VIJAYALAKSHMI AKELLA, Professor and Head, Civil Engineering Department, KS School of Engineering and Management, Bangalore.

This text is intended for the undergraduate and postgraduate students of Civil Engineering. The book comprehensively covers the fundamental concepts, the methodologies involved and the tools used to perform Surveying. Along with the basic topics the book also delves on the advanced level topics like Photogrammetry, Remote sensing and Astronomical Surveying. The book is incorporated with numerical problems and analytical exercises to probe into the students’ understandings.


248 pp. (approx.) / 17.8 x 23.5 cm ISBN-978-81-203-4991-9 / FORTHCOMING

ROY
Fundamentals of Surveying, 2nd ed.

S.K. ROY, has taught for more than 30 years at Jalpaiguri Government Engineering College and Bengal Engineering and Science University.

Primarily aimed to be an introductory text for the first course in surveying for civil, architecture and mining engineering students, this book, now in its second edition, is also suitable for various professional courses in surveying.

Written in a simple and lucid language, this book at the outset, presents a thorough introduction to the subject. Different measurement errors with their types and nature are described along with measurement of horizontal distances and electronic distances measurements. This text covers in detail the topics in levelling, angles and directions and compass survey. The functions and uses of different instruments, such as theodolites, tacheometers and stadia rods are also covered in the text. Besides, the book elaborates different fields of surveying, such as plane table surveying, topographical surveying, construction surveying and underground surveys. Finally, the book includes a chapter on computer applications in surveying.
KEY FEATURES

- Includes about 400 figures to explain the fundamentals of surveying.
- Uses SI units throughout the book.
- Offers more than 170 fully-solved examples including the questions generated from premier universities.
- Provides a large number of problems and answers at the end of each chapter.
- Incorporates objective questions from AMIE exams and Indian Engineering Services exams.


Latest Print 2014 / 624 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4198-2 / ₹ 395.00 / (e-book also available)

SAIKIA, et al.
Surveying

MIMI DAS SAIKIA, Professor, Civil Engineering Department, Assam Down Town University, Guwahati.
BHARGAB MOHAN DAS, is a Contract and Engineering Manager, RITTA Co. Ltd., Bangkok.
MADAN MOHAN DAS, formerly Professor, Department of Civil Engineering, Assam Engineering College, Guwahati.

Intended as a textbook for the undergraduate students of civil engineering, this comprehensive book depicts all elements of surveying including its types, tools and the most recent techniques, to overcome the barriers in construction. The book details on the elementary methods of measurements like tapes and chains to the most advanced ones like remote sensing and photogrammetry.

The book discusses types of surveying, advanced techniques evolved and the methodologies adopted to conduct surveys, in logical sequence. It systematically elucidates the concepts of land surveying, hydrographic surveying, compass surveying and so on, deriving the formulas through simple geometry, trigonometry and differential calculus. Besides, it educates the learner to handle measuring instruments, and teaches the ways to take the measurements accurately, in steps.

KEY FEATURES

- Contains figures and tables to illustrate the concepts
- Incorporates problems, and objective questions to test students’ comprehension of the subject
- Provides Solved Examples to impart practical knowledge to the students
- Includes the most recent surveying topics like EDM, Total stations, GIS, GPS and DTM

The book is also useful for the students of architecture, mining, geology and environmental engineering as well.


Latest Print 2011 / 488 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3985-9 / ₹ 350.00 / (e-book also available)

Theory of Shells/Plates

VARGHESE

Design of Reinforced Concrete Shells and Folded Plates

P.C. VARGHESE, Honorary Professor at Anna University, Chennai, was formerly Professor and Head, Department of Civil Engineering, IIT Madras.

This comprehensive and well-organized text provides a masterly exposition of the fundamentals of analysis and design of reinforced concrete shells and folded plates, commonly known as thin concrete roof structures. The text also incorporates practical designs of different types of domes, cylindrical shells, paraboloids, conoids, and groined shells, as well as various types of folded plates. The text also incorporates tables from ASCE Manual No. 31.

The book explains the subject in such a way that it can be easily understood even by students who have a basic knowledge of mathematics. Students will find the chapters on Folded Plates particularly useful as these structures are easy to build. After studying the book, their analysis and design can be done with greater ease.

KEY FEATURES

- Explains step-by-step the procedure for the design of various types of shells and folded plates.
- The book is lecture-based, each chapter dealing with one topic. (This enables the teachers to plan their lectures in a proper fashion.)
- Provides a large number of worked-out examples and review questions at ends of chapters, which are illustrative and act as brain teasers.
- Gives large number of diagrams to illustrate the concepts discussed.

This reader friendly book is intended as a text for the postgraduate students of Civil Engineering/Architecture. As with all the books of Prof. P.C. Varghese, who brings in all his years of experience and expertise into his work,
Transportation Engineering

CHAKROBORTY & DAS
Principles of Transportation Engineering

PARTHA CHAKROBORTY and ANIMESH DAS, both with Department of Civil Engineering, Indian Institute of Technology Kanpur.

This book offers a comprehensive and lucid introduction to the basic principles and modern techniques of transportation which is fast evolving as an engineering discipline. It also offers ubiquitous traditional methods that support transportation infrastructure.

Designed as a textbook, in Indian context, for the undergraduate and graduate courses in civil engineering, the book also fills the void of references available on the subject.

Lavish pedagogic features such as illustrative examples, exercise problems and ample visuals from the real world provide a vivid description of the concepts and help develop problem-solving skills among the students.


Latest Print 2012 / 572 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2212-7 / ₹ 595.00

PHI Learning — CATALOGUE 2014

KHISTY & LALL
Transportation Engineering:
An Introduction, 3rd ed.


This book offers a detailed, current and interdisciplinary introduction to transportation engineering, planning, and management. The primary audience for this textbook is undergraduate and postgraduate students in civil engineering, as well as those in urban planning, economics, management, and other related disciplines. Professionals working in the field of transportation would also find this book useful. It is a thoroughly updated edition incorporating material from the latest Highway Capacity Manual 2000, as well as the AASHTO Manual.

While numerical problem solving has been emphasized, the need to substantiate these numerical results, buttressed by proper explanations and discussions, has been duly illustrated. Several exercises at the end of chapters are the open-ended type questions requiring creativity and critical thinking.


Latest Print 2014 / 840 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2212-7 / ₹ 595.00

PAPACOSTAS & PREVEDOUROS
Transportation Engineering and Planning, 3rd ed.

C.S. PAPACOSTAS and P.D. PREVEDOUROS, both of University of Hawaii at Manoa, Honolulu, Hawaii.

This popular text uses an enriched and interdisciplinary approach to introduce transportation engineering. Besides emphasizing the fundamentals of pure sciences, mathematics, and engineering mechanics, the text
incorporates new concepts in societal context, geometric
design, human factors, traffic engineering through to
simulation, transportation planning, and evaluation.

Featuring latest developments on transportation
infrastructure, it offers state-of-the-art knowledge on the
subject. The text weaves the wide spectrum of coverage
ranging from basic engineering principles through to
applications, implications, and forecasting into four
sections—
• Design and Operation
• Transportation Systems
• Transportation Impacts
• Supporting Elements

With all the innovative learning aids, the book will prove
to be a valuable instructional tool for the students and
professionals in civil and transportation engineering.

**Contents:** Preface. Introduction and Background. Part 1:
Design and Operation—Roadway Design. Traffic Stream
Flow Models. Capacity and Level of Service Analysis—
Part 2: Transportation Systems—Transportation Modes.
Urban and Intelligent Transportation Systems.
Transportation Planning. Travel-Demand Forecasting.
Part 3: Transportation Impacts—Traffic Impact and
Evaluation and Choice. Part 4: Supporting Elements—
Elements of Engineering Economy. Probability and
Statistics. Queuing and Simulation. Transportation
Software. Appendix A—1982 Guidelines for the
Preparation of Environmental Documents. Index.

**Latest Print 2014 / 704 pp. / 17.8 × 23.5 cm**
ISBN-978-81-203-2154-0 / ₹ 475.00

SARKAR, et al.  
**Transportation Planning: Principles, Practices and Policies**

PRADIP KUMAR SARKAR, Professor, Department of
Transport Planning, School of Planning and Architecture,
New Delhi.
VINAY MAITRI, Professor of Programming and Head of
the Centre for Analysis and System Studies, GIS and
Remote Sensing, School of Planning and Architecture,
New Delhi.
G.J. JOSHI, Civil Engineering, is Associate Professor,
Department of Civil Engineering, SVNIT, Surat.

Transportation planning plays a useful role as a lifeline for
any society. It comprises applications of science and
art, where a great deal of judgement coupled with its
technical elements is required to arrive at a meaningful
decision in order to develop transportation infrastructure
facilities for the community. Transportation planning,
thereby, helps in achieving a safer, faster, comfortable,
convenient, economical and environment-friendly
movement of people and goods traffic.

In this context, an attempt has been made to write a
comprehensive book on this subject, which not only deals
with the basic principles and fundamentals of
transportation planning but also keeps abreast of the
current practices and policies conducted in transportation
planning.

Divided into 23 chapters, the book felicitously proffers
the fundamental techniques of transportation planning
and travel demand modelling, urban form and urban
structure and their relation with transport pattern, land
use-transport model, accessibility and mobility
consideration in transport modelling, graph theory and
road network planning, cost benefit analysis, mass
transport planning, applications of intelligent transport
system, applications of software in transport planning,
and transport policies.

Exploiting a systematic approach avoiding prolixity, this
book will prove to be a vade mecum for the
undergraduate and postgraduate students of civil
engineering and transportation engineering. Besides, this
book is of immense benefit to the students opting a
course on Master of Planning conducted in various
institutes.

**HIGHLIGHTS OF THE BOOK**
• Systematically organised concepts well-supported with ample illustrations
• Prodigious illustrative figures and tables
• Incorporates chapter-end summary to help in grasping the quirk concepts
• Presents state-of-the-art data
• Includes chapter-end review questions to help students preparing for examination

**Contents:** Preface. Introduction to Transportation Planning. Study Area. Traffic Surveys and Data Collection.

**Latest Print 2014 / 472 pp. / 17.8 x 23.5 cm**
ISBN-978-81-203-4994-0 / ₹ 495.00 / (e-book also available)

**Water Resources Engineering**

AGARWAL

**Ground Water Hydrology**

V.C. AGARWAL, Professor and Head, Department of Civil Engineering, Shepherd School of Engineering and Technology, SHIATS, Naini, Allahabad.

This book presents a comprehensive discussion of basics
of groundwater hydrology, its hydrologic and engineering aspects, and the mechanics involved in the study of flow of groundwater. The matter is presented in a logical sequence, placing emphasis on the application of theory and on the practical aspects of groundwater hydrology.

The book introduces the geological formations of aquifers, discusses soil physics, describes the solutions of differential equations for confined and unconfined aquifers, elucidates groundwater flow equations and explains the phenomenon of interference of wells.

The book also deals with tube wells and open wells, their design criteria, construction and work, revitalization and spacing, as well as their potential for irrigation. The issues of groundwater prospecting, analog models to study the response of aquifers to simulated field conditions, the current issues of concern pertaining to quality parameters of groundwater, and applications of remote sensing for survey and geological explorations for groundwater, are all addressed in the latter part of the book.

The book is intended for the senior undergraduate students of civil engineering and postgraduate students (who specialize in Water Resources Engineering) of civil engineering. Besides it will be useful to the students pursuing courses in agricultural engineering.

KEY FEATURES
- Includes numerous objective-type questions (with answers) at the end of each chapter
- Contains worked-out numerical problems
- Provides chapter-end questions and unsolved numerical problems with answers for practice by students

Contents:

Latest Print 2012 / 372 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-4619-2 / ₹ 325.00 / (e-book also available)

DAS & SAIKIA

Watershed Management

MADAN MOHAN DAS, formerly Professor, Department of Civil Engineering, Assam Engineering College, Guwahati. MIMI DAS SAIKIA, Professor, Civil Engineering Department, Assam Down Town University, Guwahati.

Watershed management has evolved and passed through several developmental stages. Realising the importance of watershed management, great efforts have been made by the government in preparing implementation strategies and the technical institutions have also introduced the subject in their curriculum at senior undergraduate and postgraduate levels of civil and agricultural engineering. Since this is a multidisciplinary subject, it finds place in environmental science and forestry curriculum as well. The book, comprising of 16 chapters, provides comprehensive coverage of the subject. Covering the concepts and principles of watershed management, the book discusses watershed characteristics, causes of watershed deterioration, soil erosion and soil–water relationship, management of natural drainages in watershed, wasteland, landslide and land drainage management, arable and non-arable land, design flow and design storm and effect of watershed on the community. Chapters on flood routing through channels and reservoirs in watershed and flood damage mitigation management in watershed add further value to the book.

Contents:

Latest Print 2012 / 312 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4676-5 / ₹ 295.00 / (e-book also available)

DAS & SAIKIA
Hydrology

MADAN MOHAN DAS, formerly Professor, Department of Civil Engineering, Assam Engineering College, Guwahati.

MIMI DAS SAIKIA, Professor, Civil Engineering Department, Assam Down Town University, Guwahati.

Primarily intended as a textbook for the undergraduate and postgraduate students of civil engineering, this book introduces the concepts of hydrology in a comprehensive manner. It covers all the aspects of hydrology in 15 chapters.

The book starts with the hydrologic cycle which is the central concept of hydrology. Then it moves on to basics of hydrometeorology, abstraction losses like infiltration, runoff in different forms, instantaneous unit hydrograph (IUH) and its mathematical concepts like convolution integral, synthetic unit hydrograph (SUH) and S-hydrograph. Finally, the text concludes with estimation of flood by empirical equations and different flood frequency analysis, and hydrology of basin management which deals with soil conservation, water shed management and control of soil erosion that are very important for agricultural engineering.

KEY FEATURES
• Provides worked out examples and problems (in SI units).
• Presents all possible methods of design including Ranga-Raju-Misri’s new approach of canal design.
• Gives numerous illustrations to reinforce the understanding of the subject.

Besides undergraduate students, this book will also be of immense use to the postgraduate students of water resources engineering.


Latest Print 2014 / 436 pp. / 16.0 × 24.1 cm
ISBN-978-81-203-3587-5 / ₹ 395.00 / (e-book also available)

GHANSHYAM DAS
Hydrology and Soil Conservation Engineering including Watershed Management, 2nd ed.

GHANSHYAM DAS, formerly Emeritus Fellow (AICTE) and Professor in Soil and Water Conservation Engineering, G.B. Pant University of Agriculture and Technology, Pantnagar.

Streamlined to facilitate student understanding, this second edition, containing the latest techniques and methodologies and some new problems, continues to provide a comprehensive treatment of hydrology of watersheds, soil erosion problems, design and installation
of soil conservation practices and structures, hydrologic and sediment yield models, watershed management and water harvesting. It also deals with the special requirements of management of agricultural and forested watersheds.

This book is designed for undergraduate students of agricultural engineering for courses in hydrology, and soil and water conservation engineering. It will also be of considerable value to students of agriculture, soil science, forestry, and civil engineering.

FEATURES
- Emphasises fundamentals using numerous illustrations to help students visualise different phenomena
- Offers lucid presentation of field practices
- Presents the analysis and design of basic hydraulic structures
- Devotes an entire chapter to watershed management
- Provides numerous solved design problems and exercise problems to develop a clear understanding of the theory
- Gives theoretical questions, and objective type questions with answers to test the students’ understanding.

Contents:
- Preface
- Introduction
- Precipitation
- Abstraction
- Losses
- Stream Flow
- Runoff
- Frequency Analysis of Hydrologic Events
- Hydrographs
- Flood Routing
- System
- Storage
- Evaporation and Transpiration
- Infiltration
- Soil-Water Relationship
- Soil Water Measurement
- Irrigation System
- Water Requirement of Crops
- Methods of Irrigation
- Irrigation and Fertilizer Use
- Water Management for students of agriculture both at the undergraduate and postgraduate levels. The scope of the book has been expanded to include latest development.

The book has useful research data and a large number of diagrams for easy comprehension of the topics. The end-of-chapter problems and numerous worked-out examples serve to aid further understanding of the subject. The book also contains an extensive glossary.

Contents:
- Preface
- General
- Water Wealth and Irrigation in India
- Soil-Water Relationship
- Soil Water Measurement
- Soil Water-Plant Relationship
- Estimating Water Requirement of Crops
- Methods of Irrigation
- Measurement of Water
- Irrigation Efficiency
- Scheduling Irrigation
- Irrigation Practices in Crops
- Quality of Water and Irrigation with Saline Water
- Irrigation and Cropping Pattern
- Irrigation and Fertilizer Use
- Water Management in High Water Table Areas
- On-farm Irrigation System
- Appendices
- Glossary
- Subject Index

Latest Print 2014
- 572 pp. / 16.0 x 24.1 cm
- ISBN-978-81-203-4826-4 / ₹ 450.00 / (e-book also available)

DILIP KUMAR MAJUMDAR

Irrigation Water Management: Principles and Practice, 2nd ed.

MAJUMDAR

VIESSMAN, Jr. & LEWIS

Introduction to Hydrology, 5th ed.

WARREN VIESSMAN, Jr., University of Florida.
GARY L. LEWIS, Consulting Engineer.

For the fifth edition, Introduction to Hydrology has been significantly revamped and restructured offering the reader content that is focused and streamlined. Many postgraduate level subjects and topics that were considered to be more of a handbook variety have been eliminated, in keeping with the original philosophy of the book which was to focus on providing a scope of material that supports theory-to-practice learning experience for beginning students in hydrology. The sequencing of chapters is so designed as to lead students through the underlying principles of hydrology and then to introduce them to the world of applications.

Notable changes in this fifth edition include:
- The restructured and streamlined fifth edition consists of 13 chapters, whereas the fourth edition consisted of 27 chapters.
- The chapter on statistics has been moved to an early position in the book so as to introduce these techniques before they are applied to problems in later chapters.
- There are many new solved examples and homework problems.
- Web addresses useful for securing hydrologic data and relevant information to supplement the text have been added.

Contents:
- Preface
- Introduction
- Hydrologic Measurements and Data sources
- Statistical Methods in Hydrology
- Precipitation
- Interception and Depression Storage
- Evaporation and Transpiration
- Infiltration
- Surface Water Hydrology
- Hydrographs
- Groundwater Hydrology
- Urban Hydrology
- Hydrologic Simulation and
ENGINEERING (Agricultural, Chemical, Civil and Environmental) 69


Latest Print 2014 / 624 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-3368-0 / ₹ 450.00

WURBS & JAMES
Water Resources Engineering
RALPH A. WURBS, Department of Civil Engineering, Texas A&M University, College Station, Texas.
WESLEY P. JAMES, H2WR, Inc., College Station, Texas.

This text comprehensively offers a broad coverage of pertinent topics concerning water resource engineering and combines the fundamentals of hydraulics, hydrology, and water systems design and analysis.

It also details the application of engineering concepts and methods with a perspective crucial for human welfare, economic prosperity, and economic and environment vitality.

Besides addressing needs related to developing, maintaining, protecting, and restoring the environmental and physical infrastructure, it also provides skilled help to the reader to gain solid understanding of the principles.

Ample pedagogic features like problems and examples, and incorporated latest information, foster a problem-solving aptitude towards planning, design, construction, and operation of resources and management strategies.

In all, the text is a must for students of civil and environmental engineering as well as practicing engineers.


Latest Print 2014 / 840 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-2151-9 / ₹ 595.00

Waste Supply and Wastewater Treatment

HAMMER & HAMMER, Jr.
Water and Wastewater Technology, 7th ed.
MARK J. HAMMER & MARK J. HAMMER, Jr.

This book provides comprehensive coverage of the fundamental principles and current practices in water processing, water distribution, wastewater collection, wastewater treatment, sludge processing, advanced wastewater treatment, and water reuse, along with an understanding of sustainability.

This seventh edition updates the subject matter, illustrations, and problems to incorporate new concepts and issues related to the water environment. This edition introduces the issues of water supply and water sustainability in Chapter 1 as a backdrop to the issues of water and wastewater treatment and ends in Chapter 15 with a critical focus on energy sustainability and carbon footprint. In addition, the revision focuses on energy reduction opportunities, optimization, and processes important to sustainability such as membrane biological reactors and ultraviolet disinfection.

Extensive use of illustrations in the book provide better understanding of the concepts and show modern equipment and facility.

The book is appropriate for undergraduate level civil engineering courses in Environmental Engineering/Technology, Water Supply and Sanitation, and Water Quality Control, and Environmental Studies.


Latest Print 2012 / 472 pp. / 21.6 × 27.8 cm
ISBN-978-81-203-4601-7 / ₹ 450.00

KARIA & CHRISTIAN
Wastewater Treatment: Concepts and Design Approach, 2nd ed.
G.L. KARIA, Senior Technical Consultant with Sapient Techno Consultants, Surat.
R.A. CHRISTIAN, Associate Professor, Department of Civil Engineering, S.V. National Institute of Technology, Surat.
He is also holding administrative position at S.V. National Institute of Technology.

This thoroughly revised Second Edition presents a comprehensive account of the principles of operation and design of wastewater treatment plants.

Beginning with the basic concepts of treatment of wastewater and the design considerations required of an efficient treatment plant, the book moves on to spotlight the design criteria for domestic wastewater treatment units. In essence, the text gives the detailed procedures for design computations of all units of a wastewater treatment plant. It also describes the most common types of reactors used for physical operations and biological processes in wastewater treatment plants.

Besides additional examples and exercises, this edition also includes a new chapter on “Disinfection of Wastewater”.

The book is intended for the undergraduate students of Civil and Environmental Engineering. It will also be useful to the practising professionals involved in the design of wastewater treatment plants.
KEY FEATURES

- Provides several examples supported by graphs and sketches to highlight the various design concepts of wastewater treatment units.
- Encapsulates significant theoretical and computational information, and useful design hints in Note and Tip boxes.
- Includes well-graded practice exercises to help students develop the skills in designing treatment plants.


PATWARDHAN
Industrial Waste Water Treatment

A.D. PATWARDHAN, Process Design Consultant and formerly Professor at VJTI, Mumbai.

All industrial production processes generate waste waters, which can pollute water bodies into which they are discharged without adequate treatment. It is, therefore, essential to treat such wastes and eliminate their harmful effects on the environment.

This book discusses sources, characteristics and treatment of waste waters produced in industries such as textiles, dairy, tanneries, pulp and paper, fertilizer, pesticide, organic and inorganic chemicals, engineering and fermentation. Many flow diagrams have been included to illustrate industrial processes and to indicate the sources of waste water in such processes. After describing treatment for individual factories, the author discusses the more advanced and economical common effluent plants. The text uses simple and straightforward language and makes the presentation attractive.

This book should prove extremely useful to undergraduate students of civil and chemical engineering and postgraduate students of environmental science and engineering. Industrial design consultants will also find the book very handy. To the Greens, it may offer some of the solutions to their concerns.


QASIM, MOTLEY & ZHU
Water Works Engineering: Planning, Design & Operation

SYED R. QASIM, The University of Texas at Arlington, EDWARD M. MOTLEY and GUANG ZHU, Chiang, Patel & Yerby, Inc.

This text is an end-to-end presentation of the state-of-the-art in planning, design, and operations of water treatment facilities.

Developed with a two-fold intent, it elucidates the basic principles, policies, and developments in recent water treatment technologies. Then, it cultivates step-by-step planning, design, and operational methodologies that are requisites for setting up medium-size conventional plants.

With ample illustrations and a simplified format, this book caters to the needs of civil and environmental engineering disciplines.


VIESSMAN, Jr., et al.
Water Supply & Pollution Control, 8th ed.

WARREN VIESSMAN, Jr., University of Florida, MARK J. HAMMER, Lincoln, Nebraska, ELIZABETH M. PEREZ, Palm Beach Gardens, Florida, PAUL A. CHADIK, University of Florida.

The Eighth Edition of this bestselling text has been
revised and modernized to meet the needs of today’s environmental engineering students who will be engaged in the design and management of water and wastewater systems. It emphasizes the application of the scientific method to problems associated with the development, movement, and treatment of water and wastewater. Recognizing that all waters are potential sources of supply, the authors present treatment processes in the context of what they can do, rather than dividing them along clean water or wastewater lines. An abundance of examples and homework problems amplify the concepts presented.

KEY FEATURES

- The interconnectedness of all potential water sources is illustrated by the text’s wide breadth of coverage—Water development, distribution, and use as well as water and wastewater development are all explored.
- Prominent coverage of monitoring drinking water for pathogens highlights this topic—an increasing concern as the security of drinking water becomes more critical.
- Expanded and updated material on indirect reuse of water for augmenting drinking water supplies gives prominence to this increasingly important component of water resources development.


Latest Print 2013 / 864 pp. / 17.8 × 23.5 cm

MANI
Coastal Hydrodynamics
J.S. MANI, Professor, Department of Ocean Engineering, Indian Institute of Technology Madras.

In the recent past, mushrooming coastal industries and human settlements have led to fast depletion of coastal features, overexploitation of both living and non-living ocean resources and abuse of ocean and coastal waters, resulting in nature’s aggression in the form of tsunami and storms. It is therefore necessary to understand nature to maintain harmony. This book deals with the characteristics of various natural processes that govern the coastal equilibrium.

The book gives an overview of world population and ocean resources, natural threats and man-made hazards, and their impact on coastal environment. It discusses the fundamentals of wind, waves, tides and fluid flow and describes wave theories such as linear wave theory, Stokes higher order theories, cnoidal and solitary wave theories. The text also explains the methods of estimating wave forces experienced by coastal and offshore structures. Besides, it deals with the procedures involved in the analysis of wave data and wave prediction, and sediment transport in the coastal region.

The book is intended for the undergraduate and postgraduate students of Ocean Engineering and Marine Engineering. It will also be useful for coastal engineers and managers in understanding the impact of natural processes on coastal environment.

KEY FEATURES

- Exercises given at the end of each chapter would benefit the reader to get exposed to a variety of practical problems related to coastal engineering.
- Worked out examples can be used for understanding available methods to solve problems related to coastal engineering.


Latest Print 2012 / 336 pp. / 17.8 × 23.5 cm
ISBN-978-81-203-4429-7 / ₹ 395.00 / (e-book also available)
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