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Chemical Engineering  
Textbook Catalogue  
Spring 2026



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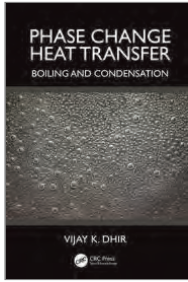
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## Phase Change Heat Transfer

Boiling and Condensation



**Vijay K. Dhir**

This book covers theory and experiments in heat transfer associated with boiling and condensation. It presents the basics of solid-liquid-vapor phase interactions and methods to measure surface wettability and interfacial tension between liquid and vapor. It is intended for upper-level undergraduate mechanical, aerospace, and chemical engineering students taking courses in Phase Change Heat Transfer; Boiling and Condensation; Nuclear Thermal Hydraulics; Heat and Mass Transfer. Exploring the mechanistic details of flow boiling heat transfer in a pool, it gives correlations for prediction of nucleate boiling, critical heat flux, and post-critical heat flux.

CRC Press

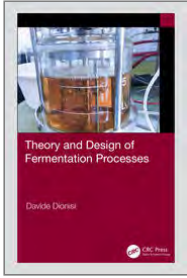
June 2025 : 364pp

Hb: 978-1-032-66837-6 : £130

eBook: 978-1-032-66843-7

\* For full contents and more information, visit: [www.routledge.com/9781032668376](http://www.routledge.com/9781032668376)

## Theory and Design of Fermentation Processes



**Davide Dionisi** University of Aberdeen, Aberdeen, UK

This textbook covers the kinetics and design of fermentation processes (any industrial process that use living microbes). It starts with concise introduction to microbes and their metabolism, followed by rate equations, stoichiometry, derivation and use of mass balances for the design processes. It covers oxygen transfer and mass balances, heat transfer, and design and scale-up/sale-down of fermentation processes. It further includes industrially relevant process examples, over 100 solved examples, questions and problems, and solution of differential equations and systems of equations in Excel. This book aims at senior undergraduate students in biochemical (fermentation) engineering.

CRC Press

October 2024 : 276pp

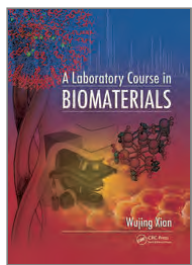
Pb: 978-1-032-10832-2 : **£48.99**

Hb: 978-1-032-10828-5 : **£94.99**

eBook: 978-1-003-21727-5

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## A Laboratory Course in Biomaterials



**Wujing Xian** University of Illinois at Urbana-Champaign, USA

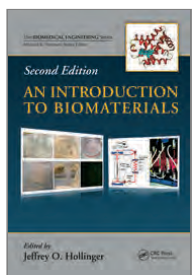
A new teaching tool for instructors in biomaterials and bioengineering, this volume is a comprehensive laboratory textbook. It trains students in laboratory skills, data analysis, problem solving, and scientific writing and integrates a variety of principles that include materials science, chemistry, biochemistry, molecular and cell biology, and engineering. Providing detailed descriptions, explanations, and illustrations of experiments, the text also includes a series of questions and answers at the end of each chapter to clarify concepts. Many of the experiments presented are adapted from research papers to reflect the recent progress in biomaterials and bioengineering.

CRC Press  
June 2009 : 216pp  
Pb: 978-1-420-07582-3 : £80.99  
Hb: 978-1-138-40742-8 : £200  
eBook: 978-0-429-13992-5

\* For full contents and more information, visit: [www.routledge.com/9781420075823](http://www.routledge.com/9781420075823)

2ND EDITION

## An Introduction to Biomaterials



*Edited by* **Jeffrey O. Hollinger** Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

*Series: Biomedical Engineering*

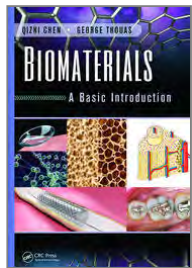
The second edition of this popular text includes nine new chapters that provide a comprehensive and up-to-date educational framework for biomaterials education. A new chapter on the biology of wound healing sets the stage for the basic requirements of standardized biomaterials testing and explains the reactions between biomaterials and the living system into which it is implanted. The book explains in vitro and in vivo testing paradigms and provides numerous examples in the chapters on experimental design, laboratory assays, and animal models. Emphasizing the importance of the regulatory process, it describes how innovation in the biomaterials process relates to patentability and inventorship.

CRC Press  
November 2011 : 644pp  
Hb: 978-1-439-81256-3 : £155  
eBook: 978-0-429-14891-0

\* For full contents and more information, visit: [www.routledge.com/9781439812563](http://www.routledge.com/9781439812563)

## Biomaterials

A Basic Introduction



**Qizhi Chen** Monash University, Clayton, Victoria, Australia  
**George Thouas** Monash University, Australia

Biomaterials is a multidisciplinary subject involving materials science, engineering, cell biology, and medicine. This textbook provides an appropriate balance between depth and broadness of coverage, sufficient to enable understanding of the most important concepts and principles by students from a wide academic spectrum. The book presents the properties and principles of biomaterials from the point of view of clinical applications and includes learning objectives, laboratory practices, and problems. It was developed from extensive lecture notes created by Dr. Chen at Monash University.

CRC Press  
May 2018 : 736pp  
Pb: 978-1-138-74966-5 : £66.99  
Hb: 978-1-482-22769-7 : £195  
eBook: 978-0-429-16141-4

\* For full contents and more information, visit: [www.routledge.com/9781138749665](http://www.routledge.com/9781138749665)

## Biomaterials Science and Technology

Fundamentals and Developments



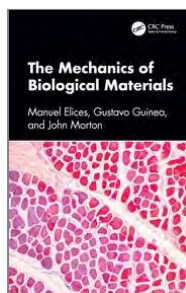
**Yaser Dahman** Ryerson University

This book presents a broad scope of the field, focusing on theory, advances, and applications of biomaterials. It reviews fabrication and properties of different classes of biomaterials and biocompatibility. It details methods used to characterize major properties of biomaterials and their modification to tailor properties for different applications. It discusses nanotechnology in biomaterials, reviews applications, and defines the set of tailored properties. Major applications are in the emerging fields of regenerative medicine as soft and hard tissues scaffolds, 3D printing as bioinks, and drug delivery.

CRC Press  
February 2019 : 376pp  
Hb: 978-1-138-61147-4 : £155  
eBook: 978-0-429-46534-5

\* For full contents and more information, visit: [www.routledge.com/9781138611474](http://www.routledge.com/9781138611474)

## The Mechanics of Biological Materials



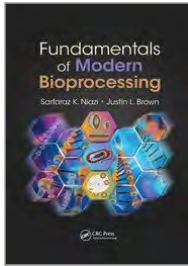
**Manuel Elices, Gustavo Guinea, John Morton**

This book introduces the mechanical principles governing the behaviour of a wide range of biological materials. The approach is systematic and based on one-dimensional (fibres), two-dimensional (membrane), and three-dimensional (bulk) biological materials. The essential mathematical tools are developed from first principles and applied to materials as diverse as spider silk, blood vessels, and bone. The text is aimed at students of chemistry, materials engineering, and biology, who do not have a background in mechanics but wish to further their knowledge of the mechanics of biological materials.

CRC Press  
July 2025 : 386pp  
Hb: 978-1-032-89277-1 : £94.99  
eBook: 978-1-003-58379-0

\* For full contents and more information, visit: [www.routledge.com/9781032892771](http://www.routledge.com/9781032892771)

## Fundamentals of Modern Bioprocessing



**Sarfaraz K. Niazi** Therapeutic Proteins International, LLC, USA, **Justin L. Brown** Pennsylvania State University, University Park, USA

This comprehensive bioprocessing textbook deals with the basic concepts, definitions, methods, and applications of the use of biological catalysts to deliver products of high value and utility, from alcohol to recombinant monoclonal antibodies to common day use fuel. It covers all modern aspects, including the means of processing that are required for drug processing to the use of biofuels, downstream bioprocessing, bioprocess design, and regulatory affairs, among many other cutting-edge topics. Applications and case studies are incorporated throughout.

CRC Press

July 2017 : 768pp

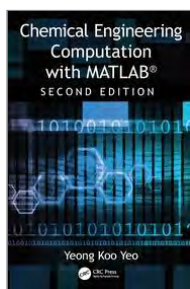
Pb: 978-1-138-89329-0 : **£69.99**

Hb: 978-1-466-58573-7 : **£185**

\* For full contents and more information, visit: [www.routledge.com/9781138893290](http://www.routledge.com/9781138893290)

2ND EDITION

## Chemical Engineering Computation with MATLAB®



**Yeong Koo Yeo** Hanyang University, Seoul, South Korea

This new edition continues to present basic to advanced levels of problem-solving techniques using MATLAB. It provides even more examples and problems extracted from core chemical engineering subject areas and all code is updated to MATLAB version 2020. It also includes a new chapter on computational intelligence. This essential textbook readies engineering students, researchers, and professionals to be proficient in the use of MATLAB to solve sophisticated real-world problems within the interdisciplinary field of chemical engineering.

CRC Press

September 2025 : 847pp

Pb: 978-0-367-54784-4 : **£52.99**

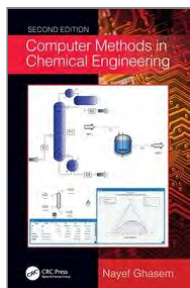
Hb: 978-0-367-54782-0 : **£155**

eBook: 978-1-003-09060-1

\* For full contents and more information, visit: [www.routledge.com/9780367547844](http://www.routledge.com/9780367547844)

2ND EDITION

## Computer Methods in Chemical Engineering



**Nayef Ghasem** United Arab Emirates University, Al-Ain

This textbook presents the most commonly used simulation software, along with the theory involved. It covers chemical engineering thermodynamics, fluid mechanics, material and energy balances, mass transfer operations, reactor design, and computer applications in chemical engineering. The Second Edition is thoroughly updated to reflect the latest updates in the featured software and has added a focus on real reactors, introduces AVEVA Process Simulation software, and includes new and updated appendixes. It gives chemical engineering students and professionals the tools needed to solve real-world problems.

CRC Press

November 2021 : 490pp

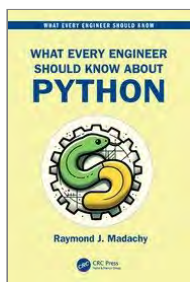
Pb: 978-0-367-76524-8 : **£66.99**

Hb: 978-0-367-76525-5 : **£170**

eBook: 978-1-003-16736-5

\* For full contents and more information, visit: [www.routledge.com/9780367765248](http://www.routledge.com/9780367765248)

## What Every Engineer Should Know About Python



**Raymond J. Madachy** Naval Postgraduate School, Monterey, California, USA

*Series: What Every Engineer Should Know*

Engineers of all disciplines can benefit from knowledge of Python. This powerful programming language can help engineers better leverage their skill set and do more sophisticated work in a shorter time. What Every Engineer Should Know About Python provides engineering students and practitioners with a simple and practical introduction to Python for technical programming and other empowering uses for engineering and scientific work, without computer science jargon. This practical and concise book serves as a self-contained introduction to engineers and readers from scientific disciplines new to programming or new to Python.

CRC Press

May 2025 : 318pp

Pb: 978-1-032-35818-5 : **£52.99**

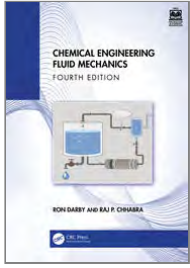
Hb: 978-1-032-35562-7 : **£130**

eBook: 978-1-003-33107-0

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4TH EDITION

## Chemical Engineering Fluid Mechanics



**Ron Darby** Texas A&M University, College Station, TX, **Raj P. Chhabra** Dept of Chem Eng, Transit Campus-I, Indian Inst of Technology, Rupnagar

Revised and expanded, the Fourth Edition of Chemical Engineering Fluid Mechanics continues to provide a balanced treatment of the basics and applications the practicing chemical engineer needs to know. With the emphasis on problem solving, the book demonstrates how to make approximations and solve complex fluid mechanics problems. It features a new chapter on Differential Mass and Momentum Balances, discussing the differential forms of continuity and momentum (Navier-Stokes) equations. Aimed at chemical engineering students taking applied fluid dynamics courses, this textbook also serves as a valuable reference for researchers and professional engineers.

CRC Press

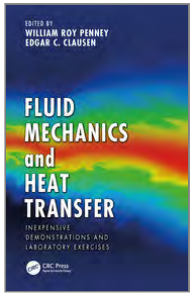
July 2026 : 576pp

Hb: 978-1-032-77706-1 : £110

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## Fluid Mechanics and Heat Transfer

Inexpensive Demonstrations and Laboratory Exercises



*Edited by* **William Roy Penney** University of Arkansas, Fayetteville, AR, **Edgar C. Clausen** University of Arkansas, Fayetteville, AR

This practical book is an ideal resource for chemical engineering, mechanical engineering, and engineering technology professors and instructors starting a new laboratory or in need of cost-effective and easy to replicate demonstrations. The book details the equipment required to perform each experiment, along with the required experimental protocol and safety precautions. Background theory is presented for each experiment, as well as sample data collected by students and a complete analysis and treatment of the data using correlations from the literature.

CRC Press

February 2018 : 236pp

Pb: 978-0-815-37431-2 : £76.99

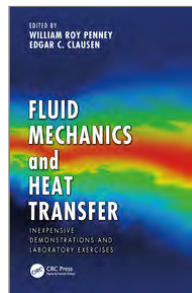
Hb: 978-0-815-37436-7 : £170

eBook: 978-1-351-24233-2

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Inexpensive Demonstrations and Laboratory Exercises



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CRC Press

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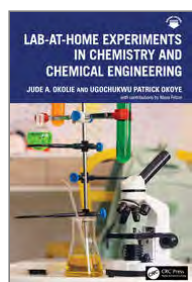
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## Lab-At-Home Experiments in Chemistry and Chemical Engineering



**Jude A. Okolie , Ugochukwu Patrick Okoye**

With the rise of remote and hybrid learning, there is an increasing need for flexibility around laboratory-based coursework. This book offers readers a guide to conducting a wide variety of Chemistry and Chemical Engineering labs and experimental procedures that can be completed easily and safely outside of a traditional lab setting, including at home. It helps students and interested readers achieve hands-on learning of chemistry- and chemical engineering-based concepts without needing sophisticated lab equipment. It features ancillary videos and downloadable spreadsheets. It is aimed at chemistry and chemical engineering students, and general readers interested in these disciplines.

CRC Press

October 2025 : 173pp

Pb: 978-1-032-44914-2 : **£35.99**

Hb: 978-1-032-44918-0 : **£89.99**

eBook: 978-1-003-37450-3

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## Process Design, Economics, and Project Engineering



**Wayne Seames** USAUSA University of North Dakota,  
Grand Forks, ND, USA

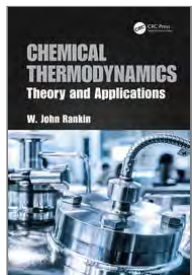
The principal goal of this textbook is to prepare process/chemical engineers for careers in a wide variety of process-related jobs. The book will also serve as reference resource for engineers working in the process and process design industries. The book assumes prerequisite knowledge of material and energy balances, heat transfer, fluid flow, and mass transfer but does not require any prerequisite knowledge of economics, process control, process safety, or material selection. It is uniquely organized to follow the project life cycle that is most commonly used by engineering contractors and the operating companies they serve in the process industries.

CRC Press  
November 2025 : 532pp  
Hb: 978-1-032-83361-3 : £105  
eBook: 978-1-003-50988-2

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## Chemical Thermodynamics

Theory and Applications



**W.J. Rankin**

This book develops the theory of chemical thermodynamics from first principles, demonstrates its relevance across scientific and engineering disciplines, and shows how thermodynamics can be used as a practical tool for understanding natural phenomenon and developing and improving technologies and products. The book provides the necessary foundations for the intelligent use of thermodynamic software packages. Another unique aspect is the inclusion of three applications chapters: heat and energy aspects of processing; the thermodynamics of metal production and recycling; and applications of electrochemistry.

CRC Press

November 2019 : 344pp

Hb: 978-0-367-22247-5 : £125

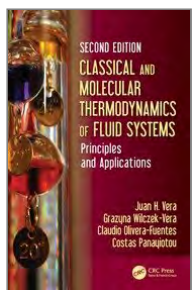
eBook: 978-0-429-27725-2

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2ND EDITION

## Classical and Molecular Thermodynamics of Fluid Systems

Principles and Applications



**Juan H. Vera** Professor Emeritus, McGill University, Montreal, Canada, **Grazyna Wilczek-Vera** McGill University, Montreal, Canada, Retired, **Claudio Olivera-Fuentes**, **Costas Panayiotou**

This text explores the connections between different thermodynamic subjects related to fluid systems, from first principles to applied topics. It clarifies concepts through simple nomenclature and algebra. It presents the structural elements of classical thermodynamics of fluid systems, covers the treatment of mixtures, and shows via examples and references the usefulness and limitations of classical thermodynamics for the treatment of practical problems related to fluid systems. The new edition recent advances and contains additional pedagogical tools. This text is written for advanced students in Chemical Engineering and Chemistry, as well as practicing engineers and researchers.

CRC Press

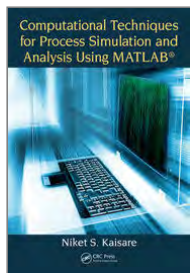
November 2024 : 563pp

Hb: 978-1-032-55734-2 : £160

eBook: 978-1-003-43198-5

\* For full contents and more information, visit: [www.routledge.com/9781032557342](http://www.routledge.com/9781032557342)

## Computational Techniques for Process Simulation and Analysis Using MATLAB®



**Niket S. Kaisare** Indian Institute of Technology, Chennai, India

MATLAB has become one of the prominent languages used in research and industry. The focus of this book will be to highlight the use of MATLAB in technical computing; or more specifically, in solving problems in Process Simulations. This book intends to bring a practical approach to expounding theories: both numerical aspects of stability and convergence, as well as linear and nonlinear analysis of systems.

CRC Press

September 2017 : 562pp

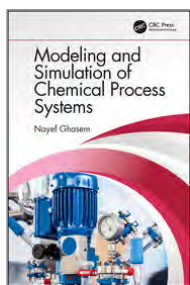
Pb: 978-1-138-74608-4 : £80.99

Hb: 978-1-498-76211-3 : £140

eBook: 978-1-315-11951-9

\* For full contents and more information, visit: [www.routledge.com/9781138746084](http://www.routledge.com/9781138746084)

## Modeling and Simulation of Chemical Process Systems



**Nayef Ghasem** United Arab Emirates University, Al-Ain

The textbook teaches readers how to model and simulate a unit process operation through developing mathematical model equations, solving model equations manually, and comparing results with efficient software. The book covers both lumped parameter systems and distributed parameter systems and uses MATLAB and Simulink to solve the system model equations for lumped parameter systems and for distributed parameter systems generated simplified partial differential equations are solved using COMSOL, an effective tool to solve PDE using fine element method. The book includes end of chapter problems and worked examples and summarizes reader goals at start of every chapter.

CRC Press

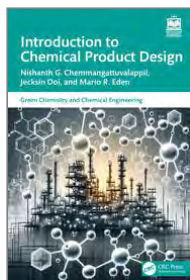
November 2015 : 518pp

Hb: 978-1-138-56851-8 : £155

eBook: 978-0-203-70508-7

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## Introduction to Chemical Product Design



**Nishanth G. Chemmangattuvalappil , Jecksin Ooi ,  
Mario R. Eden**

*Series: Green Chemistry and Chemical Engineering*

Chemical engineering has traditionally focused on the design of chemical processes to produce commodity chemicals, but there has been increased attention on the engineering of high-performance chemical products. This book provides an overview of chemical product design, explains the role of chemical engineers in chemical product design, and covers stepwise approaches used to design different types of chemical products. The text provides undergraduate and graduate chemical engineering students with practical know-how to apply chemical product design principles. It will also be of interest to chemical engineers seeking to expand their knowledge of chemical product design.

CRC Press

March 2026 : 316pp

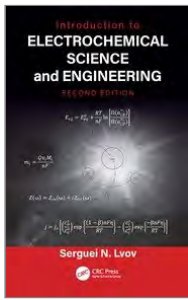
Hb: 978-1-032-70889-8 : **£96.99**

eBook: 978-1-032-70891-1

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2ND EDITION

## Introduction to Electrochemical Science and Engineering



**Serguei N. Lvov** The Pennsylvania State University,  
University Park, USA

The Second Edition of the book outlines the basic principles and techniques used in the development of electrochemical engineering-related technologies, such as fuel cells, electrolyzers, and flow-batteries. Covering topics from electrolyte solutions to electrochemical energy conversion systems and corrosion, this revised and expanded edition provides new educational material to help readers familiarize themselves with some of today's most useful electrochemical concepts. The book is written for undergraduate engineering and science students and readers in need of introductory-level content and graduate students and engineers looking for a quick introduction to the subject.

CRC Press

October 2024: 446pp

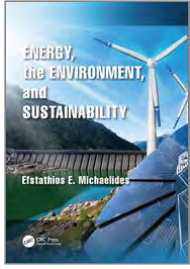
Pb: 978-1-032-07300-2: **£48.99**

Hb: 978-1-138-19678-0: **£125**

eBook: 978-1-315-29685-2

\* For full contents and more information, visit: [www.routledge.com/9781032073002](http://www.routledge.com/9781032073002)

## Energy, the Environment, and Sustainability



**Efstathios E. Michaelides** Texas Christian University, USA

*Series: Mechanical and Aerospace Engineering Series*

Energy and the Environment explains in simple terms what the energy demand is at the present, what the environmental effects of energy use are, and what can be accomplished to alleviate the environmental effects of energy use and ensure adequate energy supply. Though technical in approach, the text uses simple explanations of engineering processes and systems and algebra-based math to be comprehensible to students in a range of disciplines. Schematic diagrams, quantitative examples, and numerous problems will help students make quantitative calculations. This will assist them in comprehending the complexity of the energy-environment balance, and to analyze and evaluate proposed solutions.

CRC Press

April 2018 : 483pp

Pb: 978-1-138-03844-8 : £155

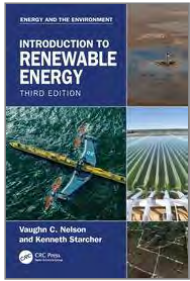
Hb: 978-1-138-48917-2 : £170

eBook: 978-1-315-17735-9

\* For full contents and more information, visit: [www.routledge.com/9781138038448](http://www.routledge.com/9781138038448)

3RD EDITION

## Introduction to Renewable Energy



**Vaughn Nelson** West Texas A&M University, Canyon, USA, **Kenneth Starcher** West Texas A&M University, Canyon, USA

*Series: Energy and the Environment*

Introduction to Renewable Energy, Third Edition covers the fundamentals of renewable energy and serves as a resource to undergraduates in renewable energy courses, non-specialists within the energy industries, or anyone working to support the successful implementation of renewable energy. This revised edition discusses developments that have occurred since the publication of the previous edition and considers the growing environmental impact of human activity on planet Earth.

CRC Press

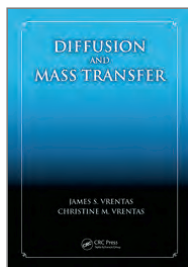
March 2025 : 450pp

Hb: 978-1-032-88841-5 : £125

eBook: 978-1-003-53991-9

\* For full contents and more information, visit: [www.routledge.com/9781032888415](http://www.routledge.com/9781032888415)

## Diffusion and Mass Transfer



**James S. Vrentas** Pennsylvania State University, University Park, USA, **Christine M. Vrentas** Pennsylvania State University, University Park, USA

Presenting diffusion and mass transfer from both engineering and fundamental science perspectives, this book offers a comprehensive summary of the theory and applies that theory to obtain detailed solutions to a wide variety of problems. It covers conservation laws and field equations, boundary conditions, constitutive equations, parameters in constitutive equations, and mathematical solution methods including Green's functions. The authors pay particular attention to polymer mass transfer, and they also discuss the free-volume theory for prediction of self-diffusion coefficients. Problems analyzed include bubble dissolution, impurity migration in plastic containers, and drug delivery using polymers.

CRC Press

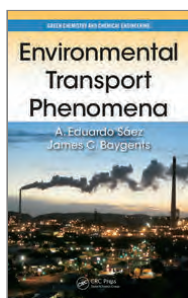
December 2012 : 644pp

Hb: 978-1-466-51568-0 : £165

eBook: 978-0-429-08702-8

\* For full contents and more information, visit: [www.routledge.com/9781466515680](http://www.routledge.com/9781466515680)

## Environmental Transport Phenomena



**A. Eduardo Sáez** University of Arizona, Tucson, USA, **James C. Baygents** University of Arizona, Tucson, USA

*Series: Green Chemistry and Chemical Engineering*

This book offers a detailed yet accessible introduction to transport phenomena. It begins by explaining the underlying principles and mechanisms that govern mass transport, and continues by tackling practical problems spanning all subdisciplines of environmental science and chemical engineering. Assuming some knowledge of ordinary differential equations and a familiarity with basic fluid mechanics applications, this classroom-tested text addresses mass conservation and macroscopic mass balances, placing a special emphasis on applications to environmental processes and presenting a mathematical framework for formulating and solving transport phenomena problems.

CRC Press

December 2014 : 244pp

Hb: 978-1-466-57623-0 : £155

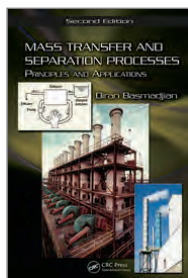
eBook: 978-0-429-10173-1

\* For full contents and more information, visit: [www.routledge.com/9781466576230](http://www.routledge.com/9781466576230)

2ND EDITION

## Mass Transfer and Separation Processes

Principles and Applications, Second Edition



**Diran Basmadjian** University of Toronto, Ontario, Canada

Revised and expanded, this second edition of Mass Transfer and Separation Processes: Principles and Applications provides a complete theoretical introduction to mass transfer theory and separation processes and discusses various biomedical, engineering, and environmental applications. It features over 100 real-world worked examples, illustrative figures, end-of-chapter exercises, and a solutions manual for qualifying instructors. Avoiding an overly mathematical presentation of material, the author conveys a sense of scale in order to develop the art of simplifying assumptions, perform proper modeling, and arrive at quick first estimates. Photographs of actual installations are included.

CRC Press

April 2007 : 512pp

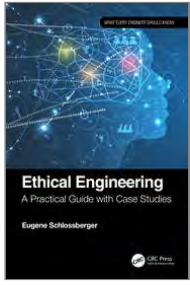
Hb: 978-1-420-05159-9 : £155

eBook: 978-0-429-14023-5

\* For full contents and more information, visit: [www.routledge.com/9781420051599](http://www.routledge.com/9781420051599)

## Ethical Engineering

A Practical Guide with Case Studies



**Eugene Schlossberger** Purdue University Northwest  
(Hammond campus), USA

*Series: What Every Engineer Should Know*

Ethical Engineering provides detailed and practical guidance in making decisions about the many ethical issues practicing engineers may face in their professional lives. It outlines a decision-making procedure and helps engineers construct an ethics toolkit consisting of professional models, a comprehensive set of ethical considerations and factors that help in weighing those considerations, and analyses of particular issues. Illustrating case studies are provided. This book helps readers navigate a variety of real-world ethical issues they are likely to face in this increasingly interdisciplinary, global, and diverse profession.

CRC Press

March 2023 : 422pp

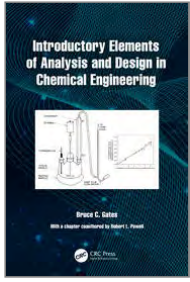
Pb: 978-1-032-15112-0 : **£54.99**

Hb: 978-1-032-15113-7 : **£140**

eBook: 978-1-003-24257-4

\* For full contents and more information, visit: [www.routledge.com/9781032151120](http://www.routledge.com/9781032151120)

## Introductory Elements of Analysis and Design in Chemical Engineering



**Bruce C. Gates , Robert L. Powell**

This textbook introduces readers to how chemical engineers think. It explains the application of analytical methods to phenomena important in chemical engineering and teaches analytical skills in the context of engineering design. A principal goal is to help readers reinforce their understanding of mathematics (especially calculus) and science as they are introduced to engineering thinking. Aimed at readers beginning their studies in chemical engineering, this textbook offers an approachable introduction to the principles of analysis and design in chemical engineering to help readers learn to think quantitatively and with a foundation of chemical engineering concepts.

CRC Press

October 2023 : 232pp

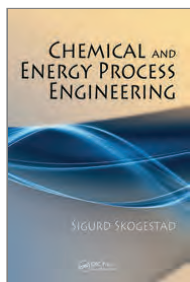
Pb: 978-1-032-55283-5 : **£69.99**

Hb: 978-1-032-55288-0 : **£180**

eBook: 978-1-003-42994-4

\* For full contents and more information, visit: [www.routledge.com/9781032552835](http://www.routledge.com/9781032552835)

## Chemical and Energy Process Engineering



**Sigurd Skogestad** NTNU, Trondheim, Norway

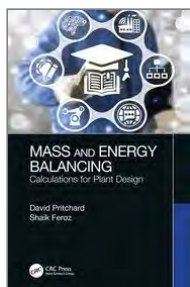
Written in an easy-to-read style, this textbook is intended for second year chemical engineering courses, but is intentionally designed to be of continuing use to practicing engineers. The author, a dynamic systems expert, approaches the introductory material in a fundamental way. He provides a thorough grounding in basic mass and energy balances and highlights their importance. He also covers timely topics such as basic thermodynamics and analysis of energy efficiency. Especially popular with students, the pedagogic approaches in this book have been classroom-tested for a decade of semesters. A solutions manual is available for instructors and additional problems are posted on the web.

CRC Press  
August 2008 : 452pp  
Hb: 978-1-420-08755-0 : £125  
eBook: 978-0-429-14449-3

\* For full contents and more information, visit: [www.routledge.com/9781420087550](http://www.routledge.com/9781420087550)

## Mass and Energy Balancing

Calculations for Plant Design



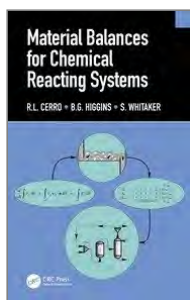
**David Pritchard , Shaik Feroz** Prince Mohammad Bin Fahd University, Saudi Arabia

The text provides a comprehensive set of calculations relating to mass and energy balances for an entire process plant. An ammonia synthesis plant is taken as a calculation model to develop the relevant mass and energy balances necessary for the design and subsequent production. Instead of teaching the basics, the text gives a detailed series of process integrated and illustrated calculations to help readers develop and design a process plant. This book will serve undergraduate Chemical Engineering students as a teaching aid in capstone design and related courses and gives useful insights to advanced students, researchers, and industry personnel within the Chemical Engineering field.

CRC Press  
May 2021 : 146pp  
Pb: 978-0-367-70967-9 : £51.99  
Hb: 978-0-367-71079-8 : £155  
eBook: 978-1-003-14920-0

\* For full contents and more information, visit: [www.routledge.com/9780367709679](http://www.routledge.com/9780367709679)

## Material Balances for Chemical Reacting Systems



**R.L. Cerro , B.G. Higgins , S. Whitaker**

Written for a first course in chemical engineering, this book offers students a rigorous approach to solving the types of macroscopic balance problems they will encounter as chemical engineers. This course is generally taken after students have completed calculus and vector analysis, and these subjects are employed throughout. This textbook is aimed at undergraduate chemical engineering students but can be used as a reference for graduate students and professional chemical engineers as well as readers from environmental engineering and bioengineering. It features a solutions manual and lecture slides available to adopting professors.

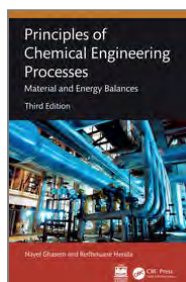
CRC Press  
September 2025 : 431pp  
Pb: 978-1-032-25530-9 : £52.99  
Hb: 978-1-032-25529-3 : £86.99  
eBook: 978-1-003-28375-1

\* For full contents and more information, visit: [www.routledge.com/9781032255309](http://www.routledge.com/9781032255309)

3RD EDITION

## Principles of Chemical Engineering Processes

Material and Energy Balances



**Nayef Ghasem , Redhouane Henda** Laurentian University, Sudbury, Ontario, Canada

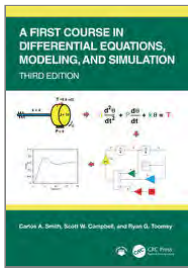
Principles of Chemical Engineering Processes remains an essential text, guiding students on the basic principles and calculation techniques used in the field of chemical engineering and providing a solid understanding of the fundamentals of the application of material and energy balances. This Third Edition has been updated to reflect advances in the field and feedback from professors and students and is packed with illustrative examples and case studies. Aimed at both chemical engineering students and professionals, this book helps readers understand how to calculate, manage, and apply the key ideas of material and energy use in chemical processes through real-world examples.

CRC Press  
March 2025 : 662pp  
Hb: 978-1-032-86057-2 : £130  
eBook: 978-1-003-59393-5

\* For full contents and more information, visit: [www.routledge.com/9781032860572](http://www.routledge.com/9781032860572)

3RD EDITION

## A First Course in Differential Equations, Modeling, and Simulation



**Carlos A. Smith** University of South Florida, Tampa, USA,  
**Scott W. Campbell** University of South Florida, Tampa,  
 USA, **Ryan G. Toomey**

This textbook shows how differential equations arise from applying basic physical principles and experimental observations to engineering systems. Avoiding overly theoretical explanations, the textbook also discusses classical and Laplace transform methods for obtaining the analytical solution of differential equations. In addition, the authors explain how to solve sets of differential equations where analytical solutions cannot easily be obtained. Incorporating valuable suggestions from mathematicians and mathematics professors, the Third Edition provides students with a practical understanding of how to apply differential equations in modern engineering and science.

CRC Press  
 September 2025 : 534pp  
 Hb: 978-1-041-02421-7 : £94.99  
 eBook: 978-1-003-61916-1

\* For full contents and more information, visit: [www.routledge.com/9781041024217](http://www.routledge.com/9781041024217)

## A Mathematics Boot Camp for Science and Engineering Students



**Ying Ma**

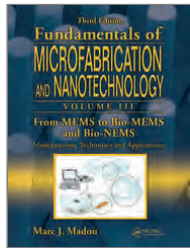
Many students have difficulty applying mathematical techniques to solve problems in science and engineering, even after completing Calculus I and II. Students who are beginning core coursework in their field of study often need additional guidance on practicing, learning, and improving their problem-solving skills for application. This book offers a solution to this issue and is specifically designed to address common errors in mathematical problem-solving for undergraduate science and engineering students. This concise and practical text offers "basic training" in mathematical problem-solving skills for undergraduate students in science and engineering disciplines.

CRC Press  
 March 2025 : 323pp  
 Pb: 978-1-032-44294-5 : £56.99  
 Hb: 978-1-032-44295-2 : £130  
 eBook: 978-1-003-37148-9

\* For full contents and more information, visit: [www.routledge.com/9781032442945](http://www.routledge.com/9781032442945)

## From MEMS to Bio-MEMS and Bio-NEMS

Manufacturing Techniques and Applications



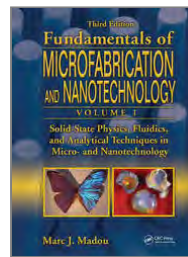
**Marc J. Madou** University of California, Irvine, USA

This text details manufacturing techniques applicable to bio-nanotechnology. After reviewing MEMS techniques, materials, and modeling, the author covers nanofabrication, genetically engineered proteins, artificial cells, nanochemistry, and self-assembly. He also discusses scaling laws in MEMS and NEMS, actuators, fluidics, and power and brains in miniature devices. He concludes with coverage of various MEMS and NEMS applications.

CRC Press  
June 2011 : 654pp  
Hb: 978-1-420-05516-0 : **£120**  
eBook: 978-0-429-10921-8

\* For full contents and more information, visit: [www.routledge.com/9781420055160](http://www.routledge.com/9781420055160)

## Solid-State Physics, Fluidics, and Analytical Techniques in Micro- and Nanotechnology



**Marc J. Madou** University of California, Irvine, USA

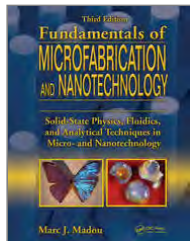
Providing a clear theoretical understanding of MEMS and NEMS, Solid-State Physics, Fluidics, and Analytical Techniques in Micro- and Nanotechnology covers all aspects of solid state physics behind nanotechnology and science. After exploring the rise of Si, MEMS, and NEMS in a historical context, the text discusses crystallography, quantum mechanics, the band theory of solids, and the silicon single crystal. It concludes with coverage of photonics, the quantum hall effect, and superconductivity. The text offers end-of-chapter problems, worked examples throughout, extensive references, and PowerPoint slides for download, along with a solutions manual for qualifying instructors.

CRC Press  
June 2011 : 656pp  
Hb: 978-1-420-05511-5 : **£140**  
eBook: 978-0-429-11248-5

\* For full contents and more information, visit: [www.routledge.com/9781420055115](http://www.routledge.com/9781420055115)

3RD EDITION

## Fundamentals of Microfabrication and Nanotechnology, Three-Volume Set



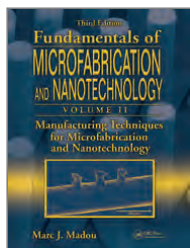
**Marc J. Madou** University of California, Irvine, USA

The first volume in this set offers a rigorous theoretical treatment of micro- and nanosciences and includes sections on solid-state physics, quantum mechanics, crystallography, and fluidics. The second volume presents a very large set of manufacturing techniques for micro- and nanofabrication and covers different forms of lithography, material removal processes, and additive technologies. The third volume focuses on manufacturing techniques and applications of Bio-MEMS and Bio-NEMS. The text is illustrated in color throughout and contains worked-out examples and end-of-chapter problems. Ancillaries are available with qualifying course adoption.

CRC Press  
August 2011 : 1992pp  
Hb: 978-0-849-33180-0 : **£400**  
eBook: 978-1-315-27416-4

\* For full contents and more information, visit: [www.routledge.com/9780849331800](http://www.routledge.com/9780849331800)

## Manufacturing Techniques for Microfabrication and Nanotechnology



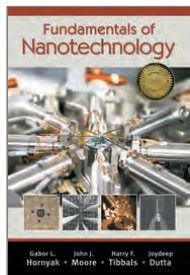
**Marc J. Madou** University of California, Irvine, USA

Designed for science and engineering students, this text focuses on emerging trends in processes for fabricating MEMS and NEMS devices. The book reviews different forms of lithography, subtractive material removal processes, and additive technologies. Both top-down and bottom-up fabrication processes are exhaustively covered and the merits of the different approaches are compared. Students can use this color volume as a guide to help establish the appropriate fabrication technique for any type of micro- or nano-machine.

CRC Press  
June 2011 : 670pp  
Hb: 978-1-420-05519-1 : **£140**  
eBook: 978-0-429-11246-1

\* For full contents and more information, visit: [www.routledge.com/9781420055191](http://www.routledge.com/9781420055191)

## Fundamentals of Nanotechnology



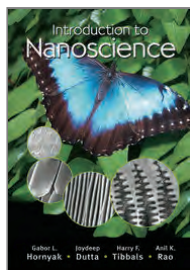
**Gabor L. Hornyak** NanoThread, Inc., Golden, Colorado, USA, **John J. Moore** Colorado School of Mines, Golden, USA, **Harry F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Joydeep Dutta**

Nanotechnology is no longer a subdiscipline of chemistry, engineering, or any other field. It represents the convergence of many fields, and therefore demands a new paradigm for teaching. This textbook is for the next generation of nanotechnologists. It surveys the field's broad landscape, exploring the physical basics such as nanorheology, nanofluidics, and nanomechanics as well as industrial concerns such as manufacturing, reliability, and safety. The authors then explore the vast range of nanomaterials and systematically outline devices and applications in various industrial sectors. This color text is an ideal companion to Introduction to Nanoscience by the same group of esteemed authors.

CRC Press  
December 2008 : 812pp  
Hb: 978-1-420-04803-2 : £125  
eBook: 978-1-315-22256-1

\* For full contents and more information, visit: [www.routledge.com/9781420048032](http://www.routledge.com/9781420048032)

## Introduction to Nanoscience



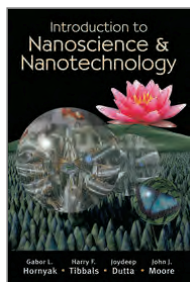
**Gabor L. Hornyak** NanoThread, Inc., Golden, Colorado, USA, **Joydeep Dutta**, **Harry F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Anil K. Rao** Metropolitan State College of Denver, Colorado, USA

Tomorrow's nanoscientist will have a truly interdisciplinary and nano-centric education, rather than, for example, a degree in chemistry with a specialization in nanoscience. For this to happen, the field needs a truly focused and dedicated textbook. This full-color masterwork is such a textbook. It introduces the nanoscale along with the societal impacts of nanoscience, then presents an overview of characterization and fabrication methods. The authors systematically discuss the chemistry, physics, and biology aspects of nanoscience, providing a complete picture of the challenges, opportunities, and inspirations posed by each facet before giving a brief glimpse at nanoscience in action: nanotechnology.

CRC Press  
May 2008 : 856pp  
Hb: 978-1-420-04805-6 : £125  
eBook: 978-0-429-14489-9

\* For full contents and more information, visit: [www.routledge.com/9781420048056](http://www.routledge.com/9781420048056)

## Introduction to Nanoscience and Nanotechnology



**Gabor L. Hornyak** NanoThread, Inc., Golden, Colorado, USA, **Harry F. Tibbals** University of Texas Southwestern Medical Center, Dallas, USA, **Joydeep Dutta**, **John J. Moore** Colorado School of Mines, Golden, USA

The maturation of nanotechnology has revealed it to be a unique and distinct discipline rather than a specialization within a larger field. Its textbook cannot afford to be a chemistry, physics, or engineering text focused on nano. It must be an integrated and multidisciplinary nano textbook. The archetype of the modern nano textbook, this text builds a solid background in characterization and fabrication methods while integrating the physics, chemistry, and biology facets. The remainder of this color text focuses on applications, examining engineering aspects as well as nanomaterials and industry-specific applications in such areas as energy, electronics, and biotechnology.

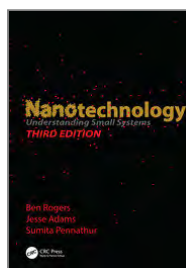
CRC Press  
December 2008 : 1634pp  
Hb: 978-1-420-04779-0 : £195  
eBook: 978-0-429-14151-5

\* For full contents and more information, visit: [www.routledge.com/9781420047790](http://www.routledge.com/9781420047790)

3RD EDITION

## Nanotechnology

Understanding Small Systems, Third Edition



**Ben Rogers** NevadaNano, Sparks, USA, **Jesse Adams** NevadaNano, Sparks, USA, **Sumita Pennathur** University of California, Santa Barbara, USA

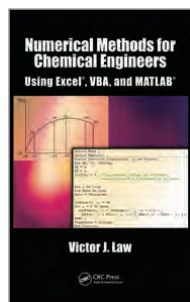
Series: *Mechanical and Aerospace Engineering Series*

This is a substantial revision of one of the first true primary texts in nanotechnology. The second edition was a CHOICE Award winner in 2011. Each chapter in the third edition has been thoroughly revised and updated. It adds a major new chapter on nanomedicine. It maintains the pedagogy along with the glossary. Vetted by a number of current and previous adopters, this text incorporates their comments in this new edition.

CRC Press  
May 2017 : 432pp  
Pb: 978-1-138-07268-8 : £51.99  
Hb: 978-1-482-21172-6 : £155  
eBook: 978-0-429-18358-4

\* For full contents and more information, visit: [www.routledge.com/9781138072688](http://www.routledge.com/9781138072688)

## Numerical Methods for Chemical Engineers Using Excel, VBA, and MATLAB



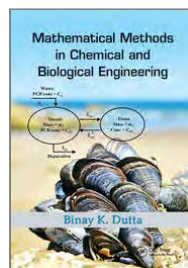
**Victor J. Law** Tulane University, New Orleans, Louisiana, USA

Since many practical engineering problems must be solved numerically, this text provides instruction on using numerical methods and Excel®/VBA for chemical and biomolecular engineering problems, covering a broad range of application areas. It also includes an introduction to MATLAB® that is made easier to learn after studying the programming tools in previous chapters. Each chapter contains examples that show in detail how a particular numerical method or programming methodology can be implemented. The chapters also contain end-of-chapter exercises, with solutions provided.

CRC Press  
March 2013 : 247pp  
Hb: 978-1-466-57534-9 : **£94.99**  
eBook: 978-0-429-19024-7

\* For full contents and more information, visit: [www.routledge.com/9781466575349](http://www.routledge.com/9781466575349)

## Mathematical Methods in Chemical and Biological Engineering



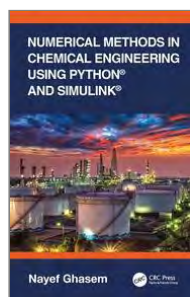
**Binay Kanti Dutta**

This book describes basic to moderately advanced mathematical techniques useful for shaping the model-based analysis of chemical and biological engineering systems. Covering an ideal balance of basic mathematical principles and applications to physico-chemical problems, the text presents examples drawn from recent literature on chemical engineering, biological and biomedical engineering, food processing, and a variety of diffusional problems to demonstrate the real-world value of the mathematical methods. Emphasis is placed on the background and physical understanding of the problems to prepare students for future challenging and innovative applications.

CRC Press  
December 2020 : 720pp  
Pb: 978-0-367-73673-6 : **£51.99**  
Hb: 978-1-482-21038-5 : **£140**  
eBook: 978-1-315-37391-1

\* For full contents and more information, visit: [www.routledge.com/9780367736736](http://www.routledge.com/9780367736736)

## Numerical Methods in Chemical Engineering Using Python® and Simulink®



**Nayef Ghasem**

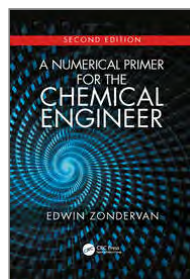
Numerical methods are vital to the practice of chemical engineering, allowing for the solution of real-world problems. Written in a concise and practical format, this textbook introduces readers to the numerical methods required in the discipline of chemical engineering and enables them to validate their solutions using both Python and Simulink. Aimed at advanced undergraduate and graduate chemical engineering students, as well as practicing chemical engineers, this textbook offers a guide to the use of two of the most widely used programs in the discipline.

CRC Press  
September 2025 : 370pp  
Pb: 978-1-032-41951-0 : **£52.99**  
Hb: 978-1-032-41946-6 : **£89.99**  
eBook: 978-1-032-52408-5 : **£76.99**

\* For full contents and more information, visit: [www.routledge.com/9781032419510](http://www.routledge.com/9781032419510)

2ND EDITION

## A Numerical Primer for the Chemical Engineer, Second Edition



**Edwin Zondervan**

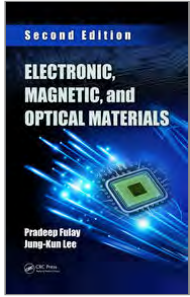
This book applies actual numerical solution strategies to formulated process models to help identify and solve chemical engineering problems. Second edition comes with chapter on numerical integration and sections on boundary value problems, general modelling principles, mass/energy balances and separate section on DAE's, with additional examples.

CRC Press  
June 2021 : 208pp  
Pb: 978-1-032-09022-1 : **£51.99**  
Hb: 978-1-138-31538-9 : **£96.99**  
eBook: 978-0-429-45634-3

\* For full contents and more information, visit: [www.routledge.com/9781032090221](http://www.routledge.com/9781032090221)

2ND EDITION

## Electronic, Magnetic, and Optical Materials



**Pradeep Fulay** University of West Virginia, Morgantown, USA, **Jung-Kun Lee** University of Pittsburgh, Pennsylvania, USA

This book integrates materials science with other engineering subjects such as physics, chemistry and electrical engineering. The authors discuss devices and technologies used by the electronics, magnetics and photonics industries and offer a perspective on the manufacturing technologies used in device fabrication. The new addition includes chapters on optical properties and devices and addresses nanoscale phenomena and nanoscience, a subject that has made significant progress in the past decade regarding the fabrication of various materials and devices with nanometer-scale features.

CRC Press

November 2016 : 554pp

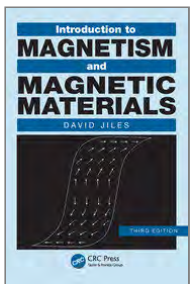
Hb: 978-1-498-70169-3 : £140

eBook: 978-1-315-37187-0

\* For full contents and more information, visit: [www.routledge.com/9781498701693](http://www.routledge.com/9781498701693)

3RD EDITION

## Introduction to Magnetism and Magnetic Materials



**David Jiles** Iowa State University, Ames, USA

The third edition of Introduction to Magnetism and Magnetic Materials is a complete revision of its predecessor, introducing you to key and current theories, practices, and applications in magnetism and magnetic materials. It includes new information on soft magnetic materials, hard magnetic materials, magnetic data storage, and magnetic evaluation of materials, magneto-transport, small particles, nanomagnetism, magnetic semiconductors, spintronics, and high-frequency magnetism. Each chapter also features updated and new exercise problems, accompanied by answers at the back of the book.

CRC Press

September 2015 : 626pp

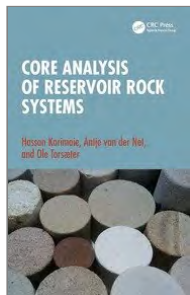
Pb: 978-1-482-23887-7 : £115

Hb: 978-1-138-44149-1 : £205

eBook: 978-0-429-16009-7

\* For full contents and more information, visit: [www.routledge.com/9781482238877](http://www.routledge.com/9781482238877)

## Core Analysis of Reservoir Rock Systems



**Hassan Karimaie, Antje van der Net, Ole Torsæter**

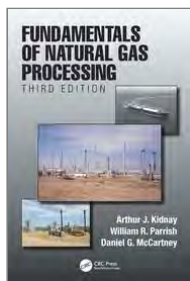
Core analysis is an important source for quantitative data on reservoir properties. While there are several books on core analysis for practitioners in these fields, this book fills a gap for students and introduces the basic laboratory equipment and procedures used in core analysis and the theoretical aspects of the parameters. It offers detailed instructions on experimental execution for core analysis for persons with limited to no experience starting in the laboratory. This concise and practical workbook is written for advanced students and early career practitioners in petroleum, chemical, and geotechnical engineering.

CRC Press  
December 2024 : 408pp  
Hb: 978-1-032-46618-7 : **£62.99**  
eBook: 978-1-003-38258-4

\* For full contents and more information, visit: [www.routledge.com/9781032466187](http://www.routledge.com/9781032466187)

### 3RD EDITION

## Fundamentals of Natural Gas Processing, Third Edition



**Arthur J. Kidnay** Colorado School of Mines, Golden, USA, **William R. Parrish** ConocoPhillips (Retired), Brigantine, New Jersey, USA, **Daniel G. McCartney** Independent Consultant, Overland Park, Kansas, USA

Offering indispensable insight from experts in the field, this book provides an introduction to the gas industry and the processes required to convert wellhead gas into valuable natural gas and hydrocarbon liquids products including LNG. The authors compile information from the literature, meeting proceedings, short courses, and their own work experiences to give an accurate picture of where gas processing technology stands today as well as to highlight relatively new technologies. Aimed at students as well as natural gas processing professionals, this edition includes discussion questions and exercises designed to reinforce important concepts.

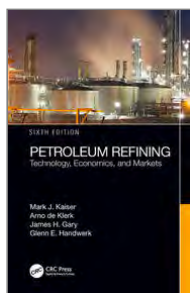
CRC Press  
October 2019 : 498pp  
Hb: 978-1-138-61279-2 : **£140**  
eBook: 978-0-429-46494-2

\* For full contents and more information, visit: [www.routledge.com/9781138612792](http://www.routledge.com/9781138612792)

### 6TH EDITION

## Petroleum Refining

Technology, Economics, and Markets, Sixth Edition



**Mark J. Kaiser** Louisiana State University, Baton Rouge, USA, **Arno de Klerk**, **James H. Gary** Colorado School of Mines, Golden, USA, **Glenn E. Handwerk** Consulting Chemical Engineer, Golden, Colorado, USA

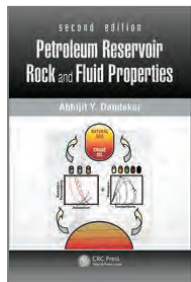
One of the few petroleum refining textbooks for academic use, this updated edition provides broad and rigorous coverage of all the process technologies of the industry along with discussions of crude oil properties, product specifications, capital cost curves, environmental regulation, and process operations. The book contains a review and edit of the solution manual with new homework problems and relevant interface material that adds to its relevancy and broadens its audience without distracting from the technical aspects.

CRC Press  
September 2019 : 722pp  
Hb: 978-1-466-56300-1 : **£96.99**  
eBook: 978-0-429-18889-3

\* For full contents and more information, visit: [www.routledge.com/9781466563001](http://www.routledge.com/9781466563001)

### 2ND EDITION

## Petroleum Reservoir Rock and Fluid Properties



**Abhijit Y. Dandekar** University of Alaska, Fairbanks, USA

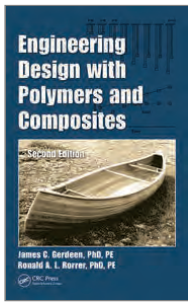
Accessible to anyone with an engineering background, this text reveals the importance of understanding rock and fluid properties in petroleum engineering. Along with new practice problems and detailed solved examples, this edition covers Stone II three-phase relative permeability model, unconventional oil and gas resources, low salinity water injection, saturated reservoirs and production trends of five reservoir fluids, impact of mud filtrate invasion and heavy organics on samples, and flow assurance problems due to solid components of petroleum. It also offers better plots for determining oil and water Corey exponents from relative permeability data.

CRC Press  
February 2013 : 544pp  
Hb: 978-1-439-87636-7 : **£150**  
eBook: 978-0-429-10936-2

\* For full contents and more information, visit: [www.routledge.com/9781439876367](http://www.routledge.com/9781439876367)

2ND EDITION

## Engineering Design with Polymers and Composites



**James C. Gerdeen, PhD, PE** University of Colorado, Denver, USA, **Ronald A.L. Rorrer, PhD, PE** University of Colorado, Denver, USA

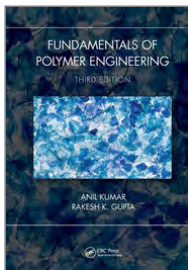
With new chapters on polymer fusing, rapid prototyping, and piezoelectric polymers, this second edition provides one of the only textbooks on the analysis and design of mechanical components made from polymer materials. It explains how to create polymer materials to meet design specifications. The authors describe modern design concepts for selecting polymers and composites for design applications. They also present computer methods for choosing polymer materials from a database, for optimal design, and for laminated plate design. A solutions manual is available for qualifying instructors.

CRC Press  
December 2011 : 420pp  
Hb: 978-1-439-86052-6 : £185  
eBook: 978-0-429-10721-4

\* For full contents and more information, visit: [www.routledge.com/9781439860526](http://www.routledge.com/9781439860526)

3RD EDITION

## Fundamentals of Polymer Engineering, Third Edition



**Anil Kumar, Rakesh K. Gupta**

This textbook for a first course on polymers assumes some familiarity with thermodynamics and transport phenomena. It covers physical and chemical aspects and the concept of property being determined by structure. It discusses polymer synthesis, associated kinetics and molecular weights and uses this information for reactor design. It covers emulsion polymerization, polymer characterization and thermodynamics, and behavior of polymers as melts, solutions and solids. It examines crystallization, diffusion of and through polymers, polymer processing, and introduces new information on polyolefin technology, biobased plastics, and post-consumer plastic recycling. Chapters updated throughout.

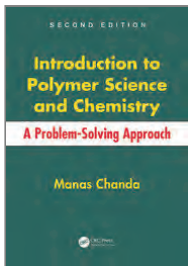
CRC Press  
December 2018 : 616pp  
Hb: 978-1-498-75950-2 : £120  
eBook: 978-0-429-39850-6

\* For full contents and more information, visit: [www.routledge.com/9781498759502](http://www.routledge.com/9781498759502)

2ND EDITION

## Introduction to Polymer Science and Chemistry

A Problem-Solving Approach, Second Edition



**Manas Chanda** Indian Institute of Science, Bangalore, India

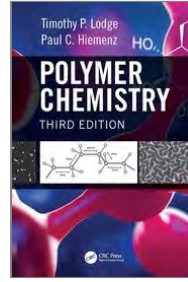
Industry and academia remain fascinated with the diverse properties and applications of polymers. However, most introductory books on this enormous and important field do not stress practical problem solving or include recent advances, which are critical for the modern polymer scientist-to-be. Updating the popular first edition of "the polymer book for the new millennium," this volume seamlessly integrates exploration of the fundamentals of polymer science and polymer chemistry. It is peppered with helpful questions and answers throughout to enhance understanding of presented theories and concepts.

CRC Press  
January 2013 : 770pp  
Hb: 978-1-466-55384-2 : £170  
eBook: 978-0-429-09904-5

\* For full contents and more information, visit: [www.routledge.com/9781466553842](http://www.routledge.com/9781466553842)

3RD EDITION

## Polymer Chemistry



**Timothy P. Lodge** University of Minnesota-Twin Cities, Minneapolis, USA, **Paul C. Hiemenz** Emeritus -Cal State Polytechnic University, Pomona, CA

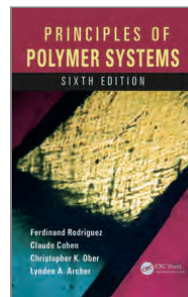
A well-rounded and articulate examination of polymer properties at the molecular level, this book focuses on fundamental principles based on underlying chemical structures, polymer synthesis, characterization, and properties. It emphasizes the logical progression of concepts and provide mathematical tools as needed, and fully derived problems for advanced calculations. This book expands and reorganizes material within chapters 2-5 to better develop polymer chemistry concepts and update the remaining chapters. New examples and problems will be added throughout.

CRC Press  
July 2020 : 676pp  
Hb: 978-1-466-58164-7 : £94.99  
IEPB: 978-1-032-20585-4 : £39.99  
eBook: 978-0-429-19081-0

\* For full contents and more information, visit: [www.routledge.com/9781466581647](http://www.routledge.com/9781466581647)

6TH EDITION

## Principles of Polymer Systems



**Ferdinand Rodriguez** Cornell University, Ithaca, New York, USA, **Claude Cohen** Cornell University, Ithaca, New York, USA, **Christopher K. Ober** Cornell University, Ithaca, New York, USA, **Lynden Archer** Cornell University, Ithaca, New York, USA

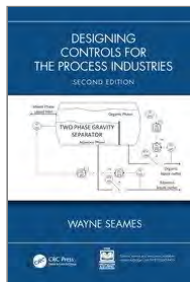
A classic text in the field of chemical engineering, this revised sixth edition offers a comprehensive exploration of polymers at a level geared toward upper-level undergraduates and beginning graduate students. It contains more theoretical background for some of the fundamental concepts pertaining to polymer structure and behavior, while also providing an up-to-date discussion of the latest developments in polymerization systems. New problems have been added to several of the chapters, and a solutions manual is available upon qualifying course adoption.

CRC Press  
December 2014 : 810pp  
Hb: 978-1-482-22378-1 : £155  
eBook: 978-0-429-17229-8

\* For full contents and more information, visit: [www.routledge.com/9781482223781](http://www.routledge.com/9781482223781)

2ND EDITION

## Designing Controls for the Process Industries



**Wayne Seames** USAUSAUniversity of North Dakota, Grand Forks, ND, USA

Offering a modern, process-oriented approach emphasizing process control scheme development instead of extended coverage of Laplace space descriptions of process dynamics, *Designing Controls for the Process Industries* focuses on aspects that are most important for contemporary practical process engineering and reflects the industry's use of digital distributed control-based systems. The new edition now features dozens of tutorial videos showing solutions to most of the example problems. Aimed at chemical engineering students in process control courses, this textbook offers an alternative to traditional texts and offers a practical, hand-on approach to design of process controls.

CRC Press

November 2023 : 600pp

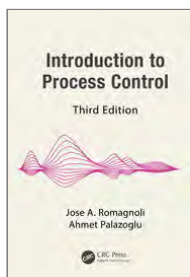
Hb: 978-1-032-43345-5 : £145

eBook: 978-1-032-52509-9 : £125

\* For full contents and more information, visit: [www.routledge.com/9781032433455](http://www.routledge.com/9781032433455)

3RD EDITION

## Introduction to Process Control



**Jose A. Romagnoli** Louisiana State University, Baton Rouge, **Ahmet Palazoglu** University of California, Davis, USA

*Series: Chemical Industries*

The new edition blends conventional topics with a modern perspective of integrated process operation, control, and information systems. Updated throughout, it addresses smart manufacturing, new data preprocessing techniques, and machine learning and artificial intelligence concepts. It guides the reader to resources needed to solve modeling, classification, and monitoring problems. It introduces the link between process optimization and process control and links discussion of modern architectures of industrial computer control systems with real case studies and applications to pilot-scale operations. It features exercises throughout and downloadable MATLAB toolboxes to reinforce learning.

CRC Press

July 2020 : 740pp

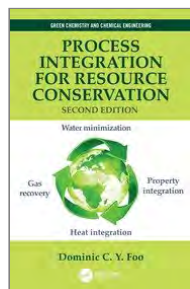
Hb: 978-0-367-36778-7 : £155

eBook: 978-0-429-35139-6

\* For full contents and more information, visit: [www.routledge.com/9780367367787](http://www.routledge.com/9780367367787)

2ND EDITION

## Process Integration for Resource Conservation



**Dominic C.Y. Foo** University of Nottingham, Malaysia

*Series: Green Chemistry and Chemical Engineering*

Process Integration for Resource Conservation presents state-of-the-art, cost-effective techniques, including pinch analysis and mathematical optimization, for numerous conservation problems. The Second Edition of this best seller adds new chapters on heat integration and retrofitting of water networks and features multiple optimisation examples via downloadable MS Excel spreadsheets. Ideal for students preparing for real-world work as well as industrial practitioners in chemical processing, the text provides a systematic guide to the latest process integration techniques for performing material recovery in process plants.

CRC Press

January 2025 : 526pp

Pb: 978-1-032-00393-1 : **£86.99**

Hb: 978-1-032-00396-2 : **£220**

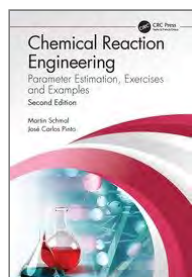
eBook: 978-1-003-17397-7

\* For full contents and more information, visit: [www.routledge.com/9781032003931](http://www.routledge.com/9781032003931)

2ND EDITION

## Chemical Reaction Engineering

Parameter Estimation, Exercises and Examples



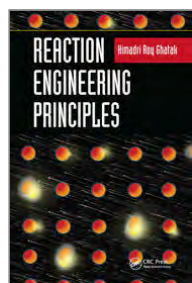
**Martin Schmal** UFRJ-COPPE, Federal Univ. of Rio de Janeiro, Brazil, **José Carlos Pinto** Engenh. Química/COPPE, Federal Univ. of Rio de Janeiro, Brazil

This book (first English edition 2014) has one major objective: teach (under)graduate students the basic concepts of kinetics and reactor design. This 2nd edition has been organized in two parts. First, a thorough discussion regarding reaction kinetics is presented. Then, basic equations are derived and used to represent the performances of batch and continuous ideal reactors, isothermal and non-isothermal reaction systems and homogeneous and heterogeneous reactor vessels, as illustrated with examples and exercises. This textbook will be of great value to (under)graduate students in chemical engineering as well as to graduate students in and researchers of kinetics and catalysis.

CRC Press  
December 2021 : 772pp  
Pb: 978-0-367-49446-9 : **£76.99**  
Hb: 978-1-032-07060-5 : **£195**  
eBook: 978-1-003-04660-8

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## Reaction Engineering Principles



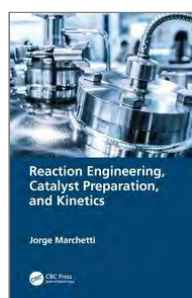
**Himadri Roy Ghatak** Sant Longowal Institute of Engineering and Technology, Punjab, India

This textbook begins by covering the basic building blocks of chemical reaction engineering—stoichiometry, kinetics, and thermodynamics—before venturing into the world of reactors. The design and performance evaluation of reactors are conveniently grouped into chapters based on an increasing degree of difficulty. Accordingly, isothermal reactors—batch and ideal flow types—are addressed first, followed by non-isothermal reactor operation, non-ideal flow in reactors, and some special reactor types. For better comprehension, detailed derivations, problem solving steps, worked examples, graphics, and practice exercises are included.

CRC Press  
April 2016 : 408pp  
Hb: 978-1-498-75856-7 : **£140**  
eBook: 978-1-315-36778-1

\* For full contents and more information, visit: [www.routledge.com/9781498758567](http://www.routledge.com/9781498758567)

## Reaction Engineering, Catalyst Preparation, and Kinetics



**Jorge Marchetti**

This textbook covers reaction engineering, catalyst preparation, and kinetics. It features a section of fully solved examples as well as end of chapter problems. It includes coverage of catalyst characterization and its impact on kinetics and reactor modeling. It presents simpler cases as well as fully developed complicated scenarios.

CRC Press  
October 2024 : 380pp  
Pb: 978-0-367-76423-4 : **£48.99**  
Hb: 978-1-138-60598-5 : **£140**  
eBook: 978-0-429-46684-7

\* For full contents and more information, visit: [www.routledge.com/9780367764234](http://www.routledge.com/9780367764234)

## Separation Process Essentials



**Alan M. Lane** The University of Alabama

Separation Process Essentials provides an interactive approach for students to learn the main separation processes (distillation, absorption, stripping, and solvent extraction) using material and energy balances with equilibrium relationships, while referring readers to other more complete works when needed. Membrane separations are included as an example of non-equilibrium processes. This book is aimed at second and third year undergraduate students in Chemical engineering, as well as professionals in the field of Chemical engineering, and can be used for a one semester course in separation processes and unit operations.

CRC Press

October 2019 : 374pp

Hb: 978-1-138-08608-1 : £125

eBook: 978-1-315-11113-1

\* For full contents and more information, visit: [www.routledge.com/9781138086081](http://www.routledge.com/9781138086081)

3RD EDITION

## Technical Writing

A Practical Guide for Engineers, Scientists, and Nontechnical Professionals



**Philip A. Laplante** The Pennsylvania State University, Malvern, USA, **Chris Laplante**

*Series: What Every Engineer Should Know*

This practical text enables readers to write, edit, and publish materials of a technical nature, including books, articles, reports, and electronic media. Written by experienced practicing engineers, this guide complements traditional technical writing manuals through presentation of first-hand examples that help readers understand practical considerations in writing and producing technical content. The new edition includes new and updated exercises, examples, and case studies and includes new content on software/systems documentation, popular writing tools, and technologies such as generative AI. It is aimed at students and professionals in the science and engineering domains.

CRC Press

November 2025 : 271pp

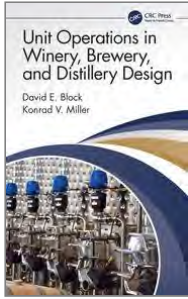
Pb: 978-1-032-84374-2 : £47.99

Hb: 978-1-032-84375-9 : £160

eBook: 978-1-003-51243-1

\* For full contents and more information, visit: [www.routledge.com/9781032843742](http://www.routledge.com/9781032843742)

## Unit Operations in Winery, Brewery, and Distillery Design



**David E. Block , Konrad V. Miller**

This text focuses on equipment and facility design for wineries, breweries, and distilleries and fills the need for a title that focuses on the challenges inherent to specifying and building alcoholic beverage production facilities and the equipment therein. The book walks through the process flow of grapes to wine, grain to beer, and wine and beer to distilled spirits, with an emphasis on the underlying engineering principles, the equipment involved in these processes, and the selection and design of said equipment. Written at a level accessible to both engineers and non-engineers, this textbook is aimed at students, winemakers, brewers, distillers, and process engineers.

CRC Press

November 2025 : 370pp

Pb: 978-0-367-56389-9 : **£52.99**

Hb: 978-0-367-56387-5 : **£125**

eBook: 978-1-003-09749-5

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