

2007-2008 *NEW* Chemical Engineering Titles

Chemical Engineering ~ Contents

Air Pollution	43
Biochemical Engineering	45
Chemical Reaction Engineering	48
Distillation.....	48
Engineering Mathematics.....	49
Environmental	42
Fluid Mechanics (Introduction)	43
Plant Design/Economics	48
Process Control	47
Professional References	49
Thermodynamics (Introduction)	40
Unit Operations/Design/Control	46

2007 New Titles

- **MURPHY**
Introduction to Chemical Processes47
ISBN-13: 978-0-07-284960-8 / MHID: 0-07-284960-6

2008 New Titles

- **dePABLO**
**Chemical, Biological, and Materials Engineering
Thermodynamics**40
ISBN-13: 978-0-291797-0 / MHID: 0-07-291797-0
- **CIMBALA**
**Essentials of Fluid Mechanics: Fundamentals and
Applications**43
ISBN-13: 978-0-330112-9 / MHID: 0-07-330112-4
- **NAVIDI**
Statistics for Engineers & Scientists, 2e.....49
ISBN-13: 978-0-07-330949-1 / MHID: 0-07-330949-4

Thermodynamics (Introduction)



CHEMICAL, BIOLOGICAL, AND MATERIALS ENGINEERING THERMODYNAMICS

by Juan dePablo, University of Wisconsin–Madison, and Jay Schieber, Illinois Institute of Technology

2008 (December 2006) / Hardcover / 512 pages

ISBN-13: 978-0-07-291797-0 / MHID: 0-07-291797-0

The web site contains instructor and student materials such as learning objectives, an image gallery, solutions manual and more! (Browse <http://www.mhhe.com/depablo>)

This book is an outgrowth of the authors' sense that the topics covered by the majority of traditional engineering thermodynamics texts have evolved only slightly over the last several decades. The age of "molecular manufacturing" is here, and it is important that molecular concepts be emphasized in thermodynamics texts. Unique chapters on statistical mechanics, polymers, and surface thermodynamics support this viewpoint. The text is meant to provide students with the foundations that will allow them to apply concepts from thermodynamics to a wide range of problems. A postulatory approach is adopted, in which concepts such as entropy and free energy arise as simple mathematical functions that facilitate a description of the problem at hand.

FEATURES

- Presents an applied, molecular (how molecules work rather than why they work) approach to the fundamental concepts of Chemical Engineering.
- A postulate (assume to be true) approach is adopted (less theory than other texts) allowing room for modern topics such as statistical mechanics, polymers, and surface thermodynamics.
- The text contains unique chapters such as chapter six (Molecular Interactions), chapter ten (Kinetics and Reactions), and chapter eleven (Thermodynamics of Polymers).
- Users will find guiding pedagogy such as a bulleted list of learning objectives that opens each chapter, and an end-of-chapter summary to end each chapter. Examples, postulates and key equations are shaded or boxed.
- The web site for this text will contain instructor and student materials such as an image bank, learning objectives, the solutions manual and more!

CONTENTS

1 Introduction. 2 The Postulates of Thermodynamics. 3 Generalized Thermodynamics Potentials. 4 First Applications of Thermodynamics. 5 Application to Process Design: Flow Systems. 6 Statistical Mechanics. 7 Molecular Interactions. 8 Fugacity and Vapor-Liquid Equilibrium. 9 Activity, Vapor-Liquid, and Liquid-Liquid Equilibrium. 10 Kinetics and Reactions. 11 Thermodynamics of Polymers. 12 Thermodynamics of Surfaces. A Mathematical Background. B Fluid Equations of State. C Microscopic Balances for Open Systems. D Physical Properties and References. Bibliography. Index.

International Edition

FUNDAMENTALS OF THERMAL-FLUID SCIENCES

Second Edition

by Yunus A Cengel, University of Nevada—Reno and Robert H Turner, University of Nevada—Reno

2005 / 1,232 pages / Hardcover

ISBN-13: 978-0-07-297675-5 / MHID: 0-07-297675-6

(with CD/OLC Card/ Student CD/Sub Card)

ISBN-13: 978-0-07-123926-4 / MHID: 0-07-123926-X

[IE with CD/OLC]

The book Online Learning Center offers web-based resources for instructors and students, including self-quizzing, a student study guide for thermodynamics, and Access Science. (Browse <http://www.mhhe.com/cengel>)

The Second Edition of Fundamentals of Thermal-Fluid Sciences presents balanced coverage of the three major subject areas comprising introductory thermal-fluid engineering: thermodynamics, fluid mechanics, and heat transfer. By emphasizing the physics and underlying physical phenomena involved, the text encourages creative think, development of a deeper understanding of the subject matter, and is read with enthusiasm and interest by both students and professors.

NEW TO THIS EDITION

- A new chapter on Gas Mixtures and Psychrometrics discusses the properties of non-reacting ideal gas mixtures and examines common air-conditioning practices.
- A new chapter on Momentum Analysis of Flow Systems, discussing linear and angular momentum equations, has been added to the Fluid Mechanics part of the book.
- A new chapter on Dimensional Analysis and Modeling, contributed by John M. Cimbala of The Pennsylvania State University, is available as a web chapter.
- A new chapter on Fundamentals of Thermal Radiation discusses the basic concepts of radiation and radiation properties. The chapter on Radiation Heat Transfer is also retained in this edition.
- In addition to the four new chapters, several new sections have been added to existing chapters, including: Accuracy, Precision, and Significant Digits; Energy and Environment; Compressibility Factor; Entropy Balance; Heat Transfer in Common Configurations; Natural Convection from Finned Surfaces and PCBs; Radiation Intensity. Beyond these new sections, in part II, seven new sections have been added along with two new chapters to provide completely revised and enhanced FLUID MECHANICS COVERAGE.
- Comprehensive problems with parametric studies have been added. These problems require students to conduct extensive parametric studies using Engineering Equation Solver (EES) or other suitable software. These problems are designated by a computer icon for easy recognition, and can be ignored if desired.

Features

- Electronic Solutions Manual. The detailed solutions for all text problems will be delivered via COSMOS, our new Complete Online Solution Manual Organization System. COSMOS is a database management tool geared towards assembling homework assignments, tests and quizzes.
- Exceptional homework problems—over 2,000 homework problems, including concept, review, design, computer essay, and lab-type problems, are grouped by topic for easy selection. Open-ended problem solving is encouraged and readers are given an early lead-in to design considerations. Numerous realistic economic and safety-related problems are presented to help promote cost, engineering practice, and safety awareness.
- A structured approach to problem solving is used while maintaining an informal style, giving readers a strong grounding in the concepts of engineering thermal-fluid sciences.
- EES (Engineering Equation Solver) CD-ROM packaged is free with text. EES is a powerful equation solver with built-in functions and property tables for thermodynamics and transport properties as well as automatic unit checking capability.
- Current industrial practices are highlighted by offering two applications chapters to supplement the text. Chapters on the heating and cooling of buildings and the cooling of electronic equipment are available for free download on the book website.

CONTENTS

1 Introduction and Overview. **PART I Thermodynamics:** 2 Basic Concepts of Thermodynamics. 3 Properties of Pure Substances. 4 Energy Transfer by Heat, Work, and Mass. 5 The First Law of Thermodynamics. 6 The Second Law of Thermodynamics. 7 Entropy. 8 Power and Refrigeration Cycles. 9 Gas Mixtures and Psychrometrics. **PART II Fluid Mechanics:** 10 Basic Concepts of Fluid Mechanics. 11 Fluid Statics. 12 Bernoulli and Energy Equations. 13 Momentum Analysis of Flow Structures. 14 Flow in Pipes. 15 Flow Over Bodies: Drag and Lift. **Part III Heat Transfer:** 16 Mechanisms of Heat Transfer. 17 Steady Heat Conduction. 18 Transient Heat Conduction. 19 Forced Convection. 20 Natural Convection. 21 Fundamentals of Thermal Radiation. 22 Radiation Heat Transfer. 23 Heat Exchanges. **PART VI Appendices:** Appendix 1 Property Tables and Charts (SI Units). Appendix 1 Property Tables and Charts (English Units). Appendix 3 Introduction to EES

International Edition

INTRODUCTION TO CHEMICAL ENGINEERING THERMODYNAMICS

Seventh Edition

by J M Smith, University of California, Davis; H C Van Ness, Rensselaer Polytechnic Institute; M Abbott, Rensselaer Polytechnic Institute

2005 / 768 pages / Hardcover

ISBN-13: 978-0-07-310445-4 / MHID: 0-07-310445-0

ISBN-13: 978-0-07-124708-5 / MHID: 0-07-124708-4 [IE]

Introduction to Chemical Engineering Thermodynamics, 7/e, presents comprehensive coverage of the subject of thermodynamics from a chemical engineering viewpoint. The text provides a thorough exposition of the principles of thermodynamics and details their application to chemical processes. The chapters are written in a clear, logically organized manner, and contain an abundance of realistic problems, examples, and illustrations to help students understand complex concepts. New ideas, terms, and symbols constantly challenge the readers to think and encourage them to apply this fundamental body of knowledge to the solution of practical problems. The comprehensive nature of this book makes it a useful reference both in graduate courses and for professional practice. The seventh edition continues to be an excellent tool for teaching the subject of chemical engineering thermodynamics to undergraduate students.

NEW TO THIS EDITION

- 20% new and revised homework problems
- The McGraw-Hill Perry's Handbook for Chemical Engineers CD-ROM is offered at 75% discount for students who purchase a new edition.
- COSMOS is now offered to all instructors for use in creating homework, quizzes, and tests from the supplied solutions manual content.

FEATURES

- The updated and rearranged material is user-friendly and accommodating to courses of different length and content. It provides sensible stopping places.
- The treatment of equations of state, thoroughly revised and augmented in recent editions, appears in applications throughout several chapters.
- Phase equilibrium is developed in stages, with the simple models introduced early, and the sophisticated treatments provided later.
- The material on molecular thermodynamics is presented in a single chapter at the end of the book.

CONTENTS

Preface. 1 Introduction. 2 The First Law and Other Basic Concepts. 3 Volumetric Properties of Pure Fluids. 4 Heat Effects. 5 The Second Law of Thermodynamics. 6 Thermodynamic Properties of Fluids. 7 Applications of Thermodynamics to Flow Processes. 8 Production of Power from Heat. 9 Refrigeration and Liquefaction. 10 Vapor/Liquid Equilibrium: Introduction. 11 Solution Thermodynamics: Theory. 12 Solution Thermodynamics: Applications. 13 Chemical-Reaction Equilibria. 14 Topics in Phase Equilibria. 15 Thermodynamic Analysis of Processes. 16 Introduction to Molecular Thermodynamics. **Appendixes:** A Conversion Factors and Values of the Gas Constant. B Properties of Pure Species. C Heat Capacities and Property Changes of Formation. D Representative Computer Programs. E The

Lee/Kesler Generalized-Correlation Tables. F Steam Tables. G Thermodynamic Diagrams. H UNIFAC Method. I Newton's Method. Author Index. Subject Index

International Edition

INTRODUCTION TO CHEMICAL ENGINEERING THERMODYNAMICS, SI METRIC

Sixth Edition

by J M Smith, University of California, Davis; H C Van Ness, Rensselaer Polytechnic Institute; M Abbott, Rensselaer Polytechnic Institute

2001 / 816 pages

ISBN-13: 978-0-07-008304-2 / MHID: 0-07-008304-5

[IE, SI Metric Edition]

SCHAUM'S OUTLINE OF THERMODYNAMICS FOR ENGINEERS

by Merle Potter and Craig Somerton, both of Michigan State University

1993 / 368 pages

ISBN-13: 978-0-07-050707-4 / MHID: 0-07-050707-4

Schaums Publication

CONTENTS

1 Concepts, Definition, and Basic Principles/2 Properties of Pure Substances/3 Work and Heat/4 The First Law of Thermodynamics/5 The Second Law of Thermodynamics/6 Entropy/7 Reversible Work, Irreversibility, and Availability/8 Power and Refrigeration Vapor Cycles/9 Power and Refrigeration Gas Cycles/10 Thermodynamic Relations/11 Mixtures and Solution/12 Combustion/Appendixes/ Index

SCHAUM'S OUTLINE OF THERMODYNAMICS WITH APPLICATIONS

Second Edition

by Michael Abbott, Rensselaer Polytechnic Institute; Hendrick Van Ness, Rensselaer Polytechnic Institute

1990 / 384 pages

ISBN-13: 978-0-07-000042-1 / MHID: 0-07-000042-5

Schaum Publication

International Edition

MOMENTUM, HEAT AND MASS TRANSFER

Third Edition

by C. O. Bennett, University of Connecticut; J. E. Myers, University of California, Santa Barbara

1982 / 848 pages

ISBN-13: 978-0-07-066180-6 / MHID: 0-07-066180-4 [IE]

International Edition

PRINCIPLES OF ENVIRONMENTAL ENGINEERING AND SCIENCE

by Mackenzie L Davis, Michigan State University—East Lansing,
Susan J Masten, Michigan State University—East Lansing

2004 / 704 pages

ISBN-13: 978-0-07-292186-1 / MHID: 0-07-292186-2
(with Bind-In Card)

ISBN-13: 978-0-07-123687-4 / MHID: 0-07-123687-2
(2-color text)

<http://www.mhhe.com/davismasten>

This textbook is well-suited for a course in introductory environmental engineering for sophomore- or junior-level students. The emphasis is on concepts, definitions, descriptions, and abundant illustrations, rather than on engineering design detail. A theme carried throughout the text is the concept of mass balance as a tool for problem solving. The book includes more and better coverage of chemistry, biology, and hydrology than other books in this field. The chemistry review, in particular, is very useful to students, as is the book's excellent illustration program.

CONTENTS

1 Introduction. 2 Chemistry. 3 Materials and Energy Balances. 4 Ecosystems. 5 Risk Perception, Assessment, and Management. 6 Hydrology. 7 Geological and Soil Resources. 8 Water Quality Management. 9 Water Treatment. 10 Wastewater Treatment. 11 Air Pollution. 12 Solid Waste Management. 13 Hazardous Waste Management. 14 Agricultural Impacts. 15 Noise Pollution. 16 Ionizing Radiation. Appendixes.

International Edition

CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE

Fifth Edition

by Clair N. Sawyer (deceased), Perry McCarty, Stanford University;
Gene F. Parkin, University of Iowa, Iowa City

2003 / 768 pages

ISBN-13: 978-0-07-248066-5 / MHID: 0-07-248066-1

ISBN-13: 978-0-07-119888-2 / MHID: 0-07-119888-1 [IE]

<http://www.mhhe.com/sawyer/>

CONTENTS

I Fundamentals of Chemistry for Environmental Engineering and Science: 1 Introduction. 2 Basic Concepts from General Chemistry. 3 Basic Concepts from Physical Chemistry. 4 Basic Concepts from Equilibrium Chemistry. 5 Basic Concepts from Organic Chemistry. 6 Basic Concepts from Biochemistry. 7 Basic Concepts from Colloid Chemistry. 8 Basic Concepts from Nuclear Chemistry.

II Water and Wastewater Analysis: 9 Introduction. 10 Statistical Analysis of Analytical Data. 11 Basic Concepts from Quantitative Chemistry. 12 Instrumental Methods of Analysis. 13 Turbidity. 14 Color. 15 Standard Solutions. 16 pH. 17 Acidity. 18 Alkalinity. 19 Hardness. 20 Residual Chlorine and Chlorine Demand. 21 Chloride. 22 Dissolved Oxygen. 23 Biochemical Oxygen Demand. 24 Chemical Oxygen Demand. 25 Nitrogen. 26 Solids. 27 Iron and Manganese. 28 Fluoride. 29 Sulfate. 30 Phosphorus and Phosphate. 31 Oil and Grease. 32 Volatile Acids. 33 Gas Analysis. 34 Trace Contaminants. **Appendix A:** Thermodynamic Properties (25 degrees C). **Appendix B:** Acronyms, Roman Symbols, and Greek Symbols

International Edition

INDUSTRIAL WATER POLLUTION CONTROL

Third Edition

by W. Wesley Eckenfelder, Jr., Vanderbilt University

2000 / 600 pages

ISBN-13: 978-0-07-039364-6 / MHID: 0-07-039364-8

ISBN-13: 978-0-07-116275-3 / MHID: 0-07-116275-5 [IE]

CONTENTS

Preface. Chapter 1: Source and Characteristics of Industrial Wastewaters. Chapter 2: Wastewater Treatment Processes. Chapter 3: Pre- and Primary Treatment. Chapter 4: Coagulation, Precipitation and Metals Removal. Chapter 5: Aeration and Mass Transfer. Chapter 6: Principles of Aerobic Biological Oxidation. Chapter 7: Biological Wastewater Treatment Processes. Chapter 8: Adsorption Chapter 9: Ion Exchange. Chapter 10: Chemical Oxidation. Chapter 11: Sludge Handling and Disposal. Chapter 12: Miscellaneous Treatment Processes. Bibliography

International Edition

INTRODUCTION TO ENVIRONMENTAL ENGINEERING

Third Edition

by Mackenzie L. Davis, Michigan State University; and David A. Cornwell, Environmental Engineering and Technology, Inc.

1998 / 750 pages / Hardcover

ISBN-13: 978-0-07-238777-3 / MHID: 0-07-238777-7

(with Unit Conversion Booklet)

ISBN-13: 978-0-07-115234-1 / MHID: 0-07-115234-2 [IE]

CONTENTS

1 Introduction/2 Hydrology/3 Water Treatment/4 Water Quality Management/5 Wastewater Treatment/6 Air Pollution/7 Noise Pollution/8 Solid Waste Management/9 Hazardous Waste/10 Ionizing Radiation/Appendixes/A Properties of Air, Water, and Selected Chemicals/B Noise Computation Tables and Nomographs/C EPA Hazardous Waste Code Descriptions

International Edition

SAFETY, HEALTH, AND ENVIRONMENTAL PROTECTION

by Charles A. Wentz, International Scientific Management, Inc.

1998 / 450 / Hardcover

ISBN-13: 978-0-07-116861-8 / MHID: 0-07-116861-3 [IE]

CONTENTS

1 Introduction to Regulations and Standards/2 Risk Perception and Assessment/3 Toxicology in the Workplace/4 Environmental Protection/5 Electrical Hazards and Protection/6 Fire and Explosion Hazards and Protection/7 Radiation Hazards/8 Noise Hazards/9 Hazard Communication to Employees/10 Process Operations/11 Plant Maintenance/12 Management and Engineering Control/13 Personal Protective Equipment/14 Audits, Incidents, and Emergency

International Edition

ENVIRONMENTAL IMPACT ASSESSMENT

Second Edition

by Larry Canter, University of Oklahoma

1996 / 480 pages

ISBN-13: 978-0-07-009767-4 / MHID: 0-07-009767-4

ISBN-13: 978-0-07-114103-1 / MHID: 0-07-114103-0 [IE]

CONTENTS

1 National Environmental Policy Act and Its Implementation/2 Planning and Management of Impact Studies/3 Simple Methods for Impact Identification Matrices, Networks and Checklists/4 Description of Environmental Setting/5 Environmental Indices and Indicators for Describing the Affected Environment/6 Prediction and Assessment of Impacts on the Air Environment/7 Prediction and Assessment of Impacts on the Surface Water Environment/8 Prediction and Assessment of Impacts on the Soil and Ground Water Environment/9 Prediction and Assessment of Impacts on the Noise Environment/10 Prediction and Assessment of Impacts on the Biological Environment/11 Habitat Methods for Biological Impact Prediction and Assessment/12 Prediction and Assessment of Impacts on the Cultural (Historical/Archaeological) Environment/13 Prediction and Assessment of Visual Impacts/14 Prediction and Assessment of Impacts on the Socioeconomic Environment/15 Decision Methods for Evaluation of Alternatives/16 Public Participation in Environmental Decision Making/17 Environmental Monitoring/Appendixes

Air Pollution

International Edition

AIR POLLUTION CONTROL ENGINEERING

Second Edition

by Noel deNevers, University of Utah

2000 / 608 pages

ISBN-13: 978-0-07-039367-7 / MHID: 0-07-039367-2

ISBN-13: 978-0-07-116207-4 / MHID: 0-07-116207-0 [IE]

CONTENTS

Chapter 1: Introduction to Air Pollution Control. Chapter 2: Air Pollution Effects. Chapter 3: Air Pollution Control Laws and Regulations, Air Pollution Control Philosophies. Chapter 4: Air Pollution Measurements, Emission Estimates. Chapter 5: Meteorology for Air Pollution Control Engineers. Chapter 6: Air Pollutant Concentration Models. Chapter 7: General Ideas in Air Pollution Control. Chapter 8: The Nature of Particulate Pollutants. Chapter 9: Control of Primary Particulates. Chapter 10: Control of Volatile Organic Compounds (VOCs). Chapter 11: Control of Sulfur Oxides. Chapter 12: Control of Nitrogen Oxides. Chapter 13: The Motor Vehicle Problem. Chapter 14: Air Pollutants and Global Climate. Chapter 15: Other Topics. Appendixes. Answers to Selected Problems

Fluid Mechanics (Introduction)



ESSENTIALS OF FLUID MECHANICS

Fundamentals and Applications

by John M. Cimbala, Pennsylvania State University–University Park, and Yunus A. Cengel, University Of Nevada-Reno

2008 (September 2006) / Hardcover with DVD

ISBN-13: 978-0-07-330112-9 / MHID: 0-07-330112-4 (with Student Resource DVD)

The Online Learning Center will house numerous instructor and student resources such as lecture slides, an image library, FE Exam questions, text glossary, flashcards, web links, and more! (Browse <http://www.mhhe.com/cengel>)

Essentials of Fluid Mechanics: Fundamentals and Applications is an abridged version of a more comprehensive text by the same authors, Fluid Mechanics: Fundamentals and Applications (McGraw-Hill 2006). Suitable for a one-semester course, this text communicates directly with tomorrow's engineers in a simple yet precise manner. It covers the basic principles and equations of fluids in the context of numerous, diverse real-world engineering examples, and it helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics. An abundance of figures, photographs and supplemental visual aids spark curiosity and reinforce the physics.

FEATURES

- An abridged version of the successful, Fluid Mechanics: Fundamentals and Applications by Yunus Cengel and John Cimbala (McGraw-Hill 2006), this text is suitable for a one-semester course in fluid mechanics.
- This text emphasizes the physical aspects of fluid mechanics in addition to mathematical representations and manipulations.
- Since fluid mechanics is a highly visual subject, the Cimbala text features 660 illustrations and photographs. Also included is an outstanding media program that includes narrated videos and animations.
- Topic Flexibility facilitates different approaches by covering the basics for all majors and then offers robust coverage to allow mechanical, civil, or aerospace engineering approaches.
- A Student Resources DVD is included with each text. The DVD includes the Limited Academic Version of Engineering Equation Solver (EES) with scripted solutions to select text problems and narrated Fluid Mechanics visualization videos.
- An Online Learning Center is available for students and instructors at <http://www.mhhe.com/cengel>.
- This text features Hands-on Mechanics as an additional resource for instructors. Hands-on Mechanics is a website designed for instructors who are interested in incorporating 3-Dimensional, hands-on teaching aids into their lectures.

CONTENTS

1 Introduction and Basic Concepts. 2 Properties of Fluids. 3 Pressure and Fluid Statics. 4 Fluid Kinematics. 5 Mass, Bernoulli, and Energy Equations. 6 Momentum Analysis of Flow Systems. 7 Dimensional Analysis and Modeling. 8 Internal Flow. 9 Differential Analysis of Fluid Flow. 10 External Flow: Drag and Lift. 11 Open-Channel Flow. 12 Turbomachinery.

International Edition

FLUID MECHANICS:

Fundamentals & Applications

by Yunus A Cengel, University of Nevada-Reno and John M Cimbala, Pennsylvania State University-University Park

2006

ISBN-13: 978-0-07-304465-1 / MHID: 0-07-304465-2

ISBN-13: 978-0-07-124934-8 / 0-07-124934-6 [IE]

<http://www.mhhe.com/cengel>

FluidMechanics:FundamentalsandApplicationscommunicates directly with tomorrow's engineers in a simple yet precise manner. The text covers the basic principles and equations of fluid mechanics in the context of numerous and diverse real-world engineering examples. The text helps students develop an intuitive understanding of fluid mechanics by emphasizing the physics, and by supplying attractive figures, numerous photographs and visual aids to reinforce the physics.

FEATURES

- **EMPHASIS ON PHYSICS.** This text emphasizes the physical aspects of the subject matter in addition to mathematical representations and manipulations. The authors believe that the emphasis in undergraduate education should remain on developing a sense of the underlying physical mechanisms and a mastery of solving practical problems than an engineer is likely to face in the real world.
- **VISUAL PROGRAM.** fluid mechanics is a highly visual subject, and students learn more effectively by visual stimulation. Our text features more illustrations and photographs than other books in this category. Some of the figures and photographs in the text are intended to serve as a means of emphasizing key concepts that would otherwise go unnoticed; some serve as page summaries.
- **VIDEO CLIPS AND ANIMATIONS.** In addition to text figures and photographs, there are narrated video clips of fluid mechanics experiments that complement the text material. There are also dozens of animations created with computational fluid dynamics. Both the video clips and animations can be found on the DVD that accompanies the text.
- **SYSTEMATIC SOLUTION PROCEDURE.** A well-structured approach is used in problem solving while maintaining an informal conversational style. The problem is first stated and the objectives are identified, and the assumptions made are stated together with their justifications. The properties needed to solve the problem are listed separately. Numerical values are used together with their units to emphasize that numbers without units are meaningless, and unit manipulations are as important as manipulating the numerical values with a calculator. The significance of the findings is discussed following the solutions. This approach is also used consistently in the solutions presented in the Instructor's Solutions Manual.
- **REALISTIC END-OF-CHAPTER PROBLEMS.** End-of-chapter problems are grouped under specific topics in the order they are covered to make problem selection easier for both instructors and students. Within each group of problems are CONCEPT QUESTIONS, to check the students' level of understanding of basic concepts. The COMPREHENSIVE AND REVIEW PROBLEMS are not directly tied to any specific section of a chapter—in some cases they require review of material used in previous chapters.
- **DESIGN AND ESSAY PROBLEMS.** This special category of end-of-chapter problems encourages students to make engineering judgments, to conduct independent exploration of topics of interest, and to communicate their findings in a professional manner.
- **COMPUTER PROBLEMS.** Throughout the text comprehensive problems that require conducting extensive parametric studies are incorporated using either a spreadsheet or the enclosed EES (or other suitable) software. These problems are designated by a computer icon for easy recognition.
- **CHAPTER ON CFD.** Commercial CFD (Computational Fluid Dynamics) codes are used widely in engineering practice in the design and analysis of flow systems, and it has become exceedingly important for students to have a solid understanding of the fundamental aspects, capabilities, and common pitfalls of CFD. Chapter 15 describes the fundamental concepts of CFD, and shows students how to use commercial CFD codes as a tool to solve complex fluid mechanics problems. We emphasize the application of

CFD rather than the algorithms used in CFD code.

- **APPLICATIONS SPOTLIGHT.** Written by guest authors, this feature is designed to show how fluid mechanics has diverse applications in a wide variety of fields. The Application Spotlights highlight industry and university research worldwide.
- **CHOICE OF SI ALONE OR SI/ENGLISH UNITS.** In recognition of the fact that English units are still widely used in some industries, both SI and English units are used in this text, with an emphasis on SI. Problems, tables, and charts in English units are designated by "E" after the number for easy recognition, and they can be ignored easily by SI users.
- **ACCURACY.** The accuracy of the book will be insured by thorough testing.
- **STUDENT DVD:** Packaged free with the text, the Student Resources DVD features: 1) Limited Academic Version of EES (Engineering Equation Solver) software with scripted solutions to selected text problems 2) Video Clips of fluid mechanics experiments; and 3) Animations Library (Courtesy of Fluent, Inc.) offering dozens of animations created with CFD.
- **INSTRUCTOR'S RESOURCE CD.** This CD provides all of the text images in Jpeg and PowerPoint formats and the detailed solutions to all text problems are delivered in our electronic solutions manual and organization system—COSMOS. COSMOS is a database management tool geared toward assembling homework assignments, tests, and quizzes.

CONTENTS

1 Introduction and Basic Concepts. 2 Properties of Fluids. 3 Pressure and Fluid Statics. 4 Fluid Kinematics. 5 Bernoulli and Energy Equations. 6 Momentum and Analysis of Flow Systems. 7 Dimensional Analysis and Flow Systems. 8 Flow in Pipes. 9 Differential Analysis of Fluid Flow. 10 Approximations of the Navier-Stokes Equation. 11 Flow Over Bodies: Drag and Lift. 12 Compressible Flow. 13 Open-Channel Flow. 14 Turbomachinery. 15 Computational Fluid Dynamics (CFD). Appendices: 1 Property Tables and Charts (SI Units). 2 Property Tables and Charts (English Units). 3 Introduction to EES

International Edition

FLUID MECHANICS FOR CHEMICAL ENGINEERS

Third Edition

by Noel de Nevers, University of Utah—Salt Lake City

2005 / 624 pages

ISBN-13: 978-0-07-297676-2 / MHID: 0-07-297676-4

(with Engg Sub Card)

ISBN-13: 978-0-07-123824-3 / MHID: 0-07-123824-7 [IE]

Overview and Table of Contents (Browse <http://www.mcgrawhillengineeringcs.com>)

Fluid Mechanics for Chemical Engineers retains the characteristics that made it a success in prior editions. It is still a book that emphasizes material and energy balances and maintains a practical orientation throughout. No more math is included than is required to understand the concepts presented. To meet the demands of today's market, the author has included many problems suitable for solution by computer. Two brand new chapters are included. The first, on mixing, augments the book's coverage of practical issues encountered in this field. The second, on computational fluid dynamics (CFD), shows students the connection between hand and computational fluid dynamics.

NEW TO THIS EDITION

- Approximately 30% of the homework problems have been revised or are new.
- New Chapter 15 on Two- and Three- Dimensional Fluid Mechanics.
- New chapter 19 titled Mixing.
- New chapter 20 titled Computational Fluid Dynamics (CFD).
- Many new examples and homework problems that are suitable for computer solution are included.
- Examples are presented in both SI and English units.
- The pump chapter treats not only the centrifugal pumps (which are the only type treated in most texts) but also positive displacement and regenerative pumps.

- Explicit treatment of jet pumps, with a Bunsen Burner as a solved example.
- A text Web site is available at <http://www.mcgrawhillengineeringcs.com>

CONTENTS

I PRELIMINARIES: 1 Introduction. 2 Fluid Statics. 3 The Balance Equation and the Mass Balance. 4 The First Law of Thermodynamics. **II FLOWS:** 5 Bernoulli's Equation. 6 Fluid Friction in One-Dimensional Flow. 7 The Momentum Balance. 8 One-Dimensional High-Velocity Gas Flow. **III SOME OTHER TOPICS, WHICH CAN BE VIEWED BY THE METHODS OF ONE-DIMENSIONAL FLUID MECHANICS:** 9 Model Studies, Dimensional Analysis, and Similitude. 10 Pumps, Compressors, and Turbines. 11 Flow through Porous Media. 12 Gas-Liquid Flow. 13 Non-Newtonian Fluid Flow in Circular Pipes. 14 Surface Forces. **IV TWO AND THREE DIMENSIONAL FLUID MECHANICS:** 15 Two- and three-dimensional fluid mechanics. 16 Potential Flow. 17 The Boundary Layer. 18 Turbulence. 19 Mixing. 20 Computational Fluid Mechanics. **Appendices:** A Tables of Properties. B Derivations. C Equations for two- and three-dimensional flow. D Answers to Selected Problems

Biochemical Engineering

BIOMEDICAL NANOTECHNOLOGY

by Balaji Panchapakesan

2007 (March 2007) / Hardcover / 448 pages

ISBN-13: 978-0-07-146564-9 / MHID: 0-07-146564-2

Professional Book

The content needed to develop tomorrow's nanoscale medical devices. This practical reference provides you with the manufacturing and fabrication techniques needed to design and build the nanoscale medical devices used in drug delivery systems, burn dressings, implantable teeth, bone prostheses, and much more. Each chapter begins with a quick refresher on the principles of engineering, biology, and physics then demonstrates how these principles can be applied to molecular manufacturing, molecular transport and nano-fabrication.

- Biomedical problem-solving techniques
- Manufacturing and fabrication techniques
- Covers engineering, biological and physics principles and how they apply to product design

FEATURES

- Biomedical problem-solving techniques for product designers
- Manufacturing and fabrication techniques for building nanoscale medical devices
- Explains engineering, biological and physics principles and how they apply to product design
- Provides a platform explaining applications of nanotechnology in all fields of life sciences.

INTRODUCTION TO BIOCHEMICAL ENGINEERING

by Rao

2005 / Softcover / 484 pages

ISBN-13: 978-0-07-058379-5 / MHID: 0-07-058379-X

(Tata MH Title)

A good understanding of the reaction engineering aspects is the crux of Biochemical Engineering. Introduction to Biochemical Engineering, is a book that interweaves bioprocessing with the chemical reaction engineering concepts making it apt for the students of chemical engineering. Its simple and lucid explanations, would enable even the students of biosciences to understand the reaction engineering approach with ease.

KEY FEATURES

- Excellent coverage of bioreactors - design, scale up, selection etc.
- Coverage of Rheology and mixing in fermentation broths.
- Coverage of both upstream and downstream processing.
- Coverage of non-ideal flow.
- Rich in Pedagogy
- Over 175 diagrams for better understanding of the concepts.
- 255 chapter end review questions
- 40 exercise problems

CONTENTS

1. Introduction to Bioprocessing Fundamentals. 2. Overview of Microbiology. 3. Introduction to Biochemistry. 4. Enzymes. 5. Fermentation. 6. Media Design for Fermentation. 7. Sterilization. 8. Kinetics of Microbial Growth and Biochemical Reactors. 9. Kinetics of Homogeneous Reaction and Enzyme Kinetics. 10. Ideal Reactors. 11. Multiple Reactions. 12. Non-Ideal Flow. Appendix to Chapter 12 - Procedure for Calculating Conversions using Dispersion Model, Tank-in-Series Model and Ideal Flows. 13. Rheology and Mixing in Fermentation Broths. 14. Mass Transfer in Bioprocessing Operations. 15. Heterogeneous Reaction Systems. 16. Bioreactors and Fermentation. 17. Product Recovery. 18. Effluent Treatment. 19. Design and Analysis of Bioreactors. Index.

International Edition

BIOCHEMICAL ENGINEERING FUNDAMENTALS

Second Edition

by James E. Bailey, California Institute of Technology, Pasa; David F. Ollis, North Carolina State University

1986 / 928 pages

ISBN-13: 978-0-07-066601-6 / MHID: 0-07-066601-6 [IE]

CONTENTS

1 A Little Microbiology. 2 Chemicals of Life. 3 The Kinetics of Enzyme-Catalyzed Reactions. 4 Applied Enzyme Catalysts. 5 Metabolic Stoichiometry and Energetics. 6 Molecular Genetics and Control Systems. 7 Kinetics of Substrated Utilization. 8 Product Field. 9 Biomass Production in Cell Cultures. 10 Transport Phenomena in Microbial Systems. 11 Design and Analysis of Biological Reactors. 12 Instrumentation and Control. 13 Product Recovery Operations. 14 Bioprocess Economics. 15 Analysis of Multiple Interacting Microbial Populations. 16 Reactors with Multiple Cell Populations. 17 Process Application

Unit Operations/Design/Control

International Edition

UNIT OPERATIONS IN CHEMICAL ENGINEERING

Seventh Edition

by Warren McCabe (deceased); Julian Smith, Cornell University; Peter Harriott, Cornell University

2005 / 1,152 pages / Hardcover /

ISBN-13: 978-0-07-284823-6 / MHID: 0-07-284823-5

ISBN-13: 978-0-07-124710-8 / MHID: 0-07-124710-6 [IE]

The text site will house the solutions to end-of-chapter problems, PowerPoint slides of text figures or lecture outlines, and general textbook information. (Browse <http://www.engineerings.com>)

Unit Operations of Chemical Engineering, 7th edition continues its lengthy, successful tradition of being one of McGraw-Hill's oldest texts in the Chemical Engineering Series. Since 1956 this text has been the most comprehensive of the introductory, undergraduate, Chemical Engineering titles available. Separate chapters are devoted to each of the principle unit operations, grouped into four sections: fluid mechanics, heat transfer, mass transfer and equilibrium stages, and operations involving particulate solids. Now in its seventh edition, the text still contains its balanced treatment of theory and engineering practice, with many practical illustrative examples included. Almost 30% of the problems have been revised or are new, some of which cover modern topics such as food processing and biotechnology. Other unique topics of this text include diafiltration, adsorption and membrane operations.

NEW TO THIS EDITION

- Expanded coverage biochemistry and food processing.
- Approximately 30% of the problems have been revised or are new.
- The text Web site will be located at <http://www.engineerings.com>. The site will host the solutions manual, PPT slides of text figures or lecture outlines, as well as general textbook information.

Features

- It is the most comprehensive of all current Chemical Engineering texts on unit operations, covering fluid mechanics, heat transfer, mass transfer, and solids handling.
- The text contains a balanced treatment of theory and engineering practice, with many practical illustrative examples included.
- The mass-transfer section contains chapters on adsorption and membrane operations, topics not often covered in unit operations textbooks.

CONTENTS

I Introduction: 1 Definitions and Principles. **II Fluid Mechanics:** 2 Fluid Statics and Its Applications. 3 Fluid Flow Phenomena. 4 Basic Equations of Fluid Flow. 5 Incompressible Flow in Pipes and Channels. 6 Flow of Compressible Fluids. 7 Flow Past Immersed Bodies. 8 Transportantion and Metering of Fluids. 9 Agitation and Mixing of Liquids. **III Heat Transfer and Its Applications:** 10 Heat Transfer by Conduction. 11 Principles of Heat Flow in Fluids. 12 Heat Transfer to Fluids Without Phase Change. 13 Heat Transfer to Fluids With Phase Change. 14 Radiation Heat Transfer. 15 Heat-Exchange Equipment. 16 Evaporation. **IV Mass Transfer and Its Applications:** 17 Principles of Diffusion and Mass Transfer Between Phases Theory of Diffusion. 18 Gas Absorption. 19 Humidification Operations. 20 Equilibrium-Stage Operations. 21 Distillation. 22 Introduction to Multicomponent Distillation. 23 Leaching and Extraction. 24 Drying of Solids. 25 Fixed-Bed Separations. 26 Membrane Separation Processes. 27 Crystallization. **V Operations Involving Particulate Solids:** 28 Properties and Handling of Particulate Solids. 29 Mechanical Separations. **Appendixes:** **Appendix 1** Conversion Factors and Constants of Nature. **Appendix 2** Dimensionless Groups. **Appendix 3** Dimensions, Capacities, and Weights of Standard Steel Pipe. **Appendix 4** Condenser and Heat-Exchanger Tube Data. **Appendix 5** Tyler Standard Screen Scale. **Appendix 6** Properties of Liquid Water. **Appendix 7** Properties of Saturated Steam and Water. **Appendix 8** Viscosities of Gases. **Appendix 9** Viscosities of Liquids. **Appendix 10** Thermal Conductivities of Metals. **Appendix 11** Thermal Conductivities of Various Solids and Insulating Materials. **Appendix 12** Thermal Conductivities of Gases and Vapors. **Appendix 13** Thermal Conductivities of Liquids Other Than Water. **Appendix 14** Specific Heats of Gases. **Appendix 15**

Specific Heats of Liquids. **Appendix 16** Prandtl Numbers for Gases at 1 atm and 100 C. **Appendix 17** Prandtl Numbers for Liquids. **Appendix 18** Diffusivities and Schmidt Numbers for Gases in Air at 0 C and 1 atm. **Appendix 19** Collision Integral and Lennard-Jones Force Constants. **Appendix 20** Viscosities of Liquids. Index

STOICHIOMETRY

Fourth Edition

by **B I Bhatt Consultant**, Chemical Industries, Ahmedabad and **S M Vora**, Air Products & Chemical Inc., Allentown, Pennsylvania, USA.

2004 / 656 pages

ISBN-13: 978-0-07-049494-7 / MHID: 0-07-049494-0

(Tata McGraw-Hill Title)

The fourth edition is updated with the most recent information. Problems have been included from a variety of industries making it the most authoritative book on the subject. Highlights of the Fourth Edition : Latest industrial innovations are included : newer production process for formaldehyde, recycling of flue gases in a boiler to reduce polluting emissions. Increased coverage and exercise problems on cascading type steam balances which result in efficient steam utilisation. Newer problems on purging of chemical equipment with inert gases; it has important implications especially safety. Updated Table of Element including latest revisions by IUPAC (International Union of Pure and Applied Chemistry). Use of MATHCAD software in solving stoichiometric problems; also an appendix on using MATHCAD software. New process flow diagrams giving an industrial feel e.g. process flow diagram on distillation of crude oil to cover petroleum refining. Coverage of synthetic fuels (e.g. Dimethyl Ether) for energy economy and reducing polluting emissions.

CONTENTS

1 Dimensions and Units. 2 Basic Chemical Calculations. 3 Material Balances without Chemical Reactions. 4 Equations for Chemical Reactions. 5 Energy Balances. 6 Stoichiometry and Unit Operations. 7 Combustion. 8 Stoichiometry and Industrial Problems. 9 Stoichiometry and Digital Computation. Appendixes. Index

International Edition

OPTIMIZATION OF CHEMICAL PROCESSES

Second Edition

by T. F. Edgar, and D. M. Himmelblau, both at the University of Texas at Austin

2001 / 672 pages / Hardcover

ISBN-13: 978-0-07-039359-2 / MHID: 0-07-039359-1

ISBN-13: 978-0-07-118977-4 / MHID: 0-07-118977-7 [IE]

CONTENTS

I Problem Formulation. 1 The Nature and Organization of Optimization Problems. 2 Developing Models for Optimization. 3 Formulation of the Objective Function. II Optimization Theory and Methods. 4 Basic Concepts of Optimization. 5 Optimization for Unconstrained Functions: One-Dimensional Search. 6 Unconstrained Multivariable Optimization. 7 Linear Programming and Applications. 8 Nonlinear Programming with Constraints. 9 Mixed Integer Programming. 10 Global Optimization for Problems Containing Continuous and Discrete Variables. III Applications of Optimization. 11 Heat Transfer and Energy Conservation. 12 Separation Process. 13 Fluid Flow Systems. 14 Chemical Reactor Design and Operation. 15 Optimization in Large-Scale Plant Design and Operations. 16 Integrated Planning, Scheduling, and Control in the Process Industries. Appendixes.

International Edition

CONCEPTUAL DESIGN OF CHEMICAL PROCESSES

by James Douglas, University of Massachusetts

1988 / 601 pages

ISBN-13: 978-0-07-017762-8 / MHID: 0-07-017762-7

ISBN-13: 978-0-07-100195-3 / MHID: 0-07-100195-6 [IE]

CONTENTS

Part I A Strategy For Process Synthesis and Analysis. 1 The Nature of Process Synthesis and Analysis. 2 Engineering Economics. 3 Economic Decision Making-Design of a Solvent Recovery System. Part II Developing A Conceptual Design and Finding the Best Flowsheet. 4 Input Information and Batch vs. Continuous. 5 Input-Output Structure of the Flowsheet. 6 Recycle Structure of the Flowsheet. 7 Separation System. 8 Heat-Exchanger Networks. 9 Cost Diagrams and the Quick Screening of Process Alternatives. Part III Other Design Tools And Applications. 10 Preliminary Process Optimization. 11 Process Retrofits. 12 Computer-Aided Design Programs. 13 Summary of the Conceptual Design Procedure and Extensions of the Method. Appendixes

Process Control

International Edition



INTRODUCTION TO CHEMICAL PROCESSES

by Regina M. Murphy, University of Wisconsin, Madison

2007 / Hardcover

ISBN-13: 978-0-07-284960-8 / MHID: 0-07-284960-6

ISBN-13: 978-0-07-125429-8 / MHID: 0-07-125429-3 [IE]

<http://www.mhhe.com/murphy>

As the number one publisher of undergraduate Chemical Engineering titles, McGraw-Hill has added a new text written for the recruitment course in Chemical Engineering (Chemical Process Synthesis/Mass Balances). Introduction to Chemical Processes: Principles, Analysis, Synthesis enhances student understanding of the connection between the chemistry and the process. Users will find strong coverage of chemistry, gain a solid understanding of what chemical processes do, and learn about the ways in which chemical engineers make decisions and balance constraints to come up with new processes and products. The author presents material and energy balances as tools to achieve a real goal: workable, economical, and safe chemical processes and products. Loaded with intriguing pedagogy and packaged with our popular Engineering Equation Software (EES), this text is a valuable addition to a student's first course in Chemical Engineering. Additional resources intended to guide users are also available as package options.

FEATURES

- Strong coverage of chemistry
- Treats calculations as part of the overall process as opposed to separately.
- Open-ended semester-long design projects included at the end of the book.
- Approach—the book teaches students how to invent and analyze. It's approach will enhance students' understanding of the connection between the chemistry and the process

CONTENTS

1. Converting the Earth's Resources into Useful Products. 2. Process Flowsheets, Process Variables, and Process Flow Calculators. 3. Mathematical Analysis of Material Balance Equations and Process Flowsheets. 4. Synthesis of Reactor Flowsheets and Selection of Process Conditions. 5. Selection of Separation Technologies and Synthesis of Separation Flowsheets. 6. Process Energy Calculations and Efficient Energy Utilization.

International Edition

PROCESS CONTROL

Second Edition

by Thomas E. Marlin, McMaster University, Canada

2000 / 992 pages / Hardcover

ISBN-13: 978-0-07-039362-2 / MHID: 0-07-039362-1

ISBN-13: 978-0-07-116357-6 / MHID: 0-07-116357-3 [IE]

CONTENTS

1 Introduction to Process Control. 2 Control Objectives and Benefits. Mathematical Modeling Principles. 4 Modeling and Analysis for Process Control. 5 Dynamic Behavior of Typical Process Systems. 6 Empirical Model Identification. 7 The Feedback Loop. 8 The Proportional-Integral-Derivative (PID) Algorithm. 9 PID Controller Tuning for Dynamic Performance. 10 Stability Analysis and Controller Tuning. 11 Digital Implementation of Process Control. 12 Practical Application of Feedback Control. 13 Performance of Feedback Control Systems. 14 Cascade Control. 15 Feedforward Control. 16 Adapting Single-Loop Control Systems for Non-Linear Processes. 17 Inferential Control. 18 Level and Inventory Control. 19 Single-Variable Model Predictive Control. 20 Multiloop Control Effects of Interaction. 21 Multiloop Control Performance Analysis. 22 Variable Structure and Constraint Control. 23 Centralized Multivariable Control. 24 Process Control Design Definition and Decisions. 25 Process Control Design Managing the Design Procedure. 26 Control for Product Quality and Profit. Appendices.

International Edition

PROCESS MODELING, SIMULATION AND CONTROL FOR CHEMICAL ENGINEERS

Second Edition

by William L Luyben, Lehigh University

1990 / 725 pages

ISBN-13: 978-0-07-100793-1 / 0-07-100793-8 [IE]

International Edition

MASS TRANSFER OPERATIONS

Third Edition

by Robert E. Treybal, deceased, formerly of The University of Rhode Island

1980 / 800 pages

ISBN-13: 978-0-07-066615-0 / 0-07-066615-6 [IE]

CONTENTS

1 The Mass-Transfer Operations Diffusion and Mass Transfer. 2 Molecular Diffusion in Fluids. 3 Mass-Transfer Coefficients. 4 Diffusion in Solids. 5 Interphase Mass Transfer. 6 Gas-Liquid Operations. 7 Equipment for Gas-Liquid Operations. 8 Humidification Operations, Gas Absorption. 9 Gas Absorption. 10 Distillation. 11 Liquid-Liquid Operations. 12 Liquid Extraction. 13 Solid-Fluid Operations. 14 Absorption and Ion Exchange. 15 Drying. 16 Leaching

Distillation

International Edition

CONCEPTUAL DESIGN OF DISTILLATION SYSTEMS

by Michael F Doherty and Michael F Malone, both of the University of Massachusetts, Amherst

2001 / 608 pages / Hardcover

ISBN-13: 978-0-07-248863-0 / 0-07-248863-8 (with CD-ROM)

ISBN-13: 978-0-07-118999-6 / 0-07-118999-8 [IE with CD-ROM]

CONTENTS

1 Introduction. 2 Vapor-Liquid Equilibrium and Flash Separations. 3 Binary Distillation. 4 Distillation of Multicomponent Mixtures Without Azeotropes. 5 Homogeneous Azeotropic Distillation. 6 Column Design and Economics. 7 Column Sequencing and System Synthesis. 8 Heterogeneous Azeotropic Distillation. 9 Gas Absorption and Liquid Extraction. 10 Batch Distillation. 11. Reactive Distillation. Appendices. A. Heat Effects. B. Implicit Functions. C. Azeotropy and the Gibbs-Kononov Conditions.

Plant Design/Economics

International Edition

PLANT DESIGN AND ECONOMICS FOR CHEMICAL ENGINEERS

Fifth Edition

by Max S. Peters, University of Colorado - Boulder, Klaus D. Timmerhaus, University of Colorado - Boulder, Ronald E. West, University of Colorado - Boulder

2003 / 992 pages

ISBN-13: 978-0-07-239266-1 / 0-07-239266-5

ISBN-13: 978-0-07-124044-4 / 0-07-124044-6 [IE]

CONTENTS

Chapter 1: Introduction. Chapter 2: Process Design Overview. Chapter 4: Flowsheet Development. Chapter 5: Computer-Aided Design. Chapter 6: Analysis of Cost Estimation. Chapter 7: Analysis of Depreciation, Taxes, and Investment Costs. Chapter 8: Profitability, Alternative Investments, and Replacements. Chapter 9: Optimal Design and Design Strategy. Chapter 10: Materials Selection and Utilization. Chapter 11: The Design Report. Chapter 12: Material Transfer Equipment. Chapter 13: Reactor Equipment: Design and Costs. Chapter 14: Heat-Transfer Equipment: Design and Costs. Chapter 15: Separation Equipment: Design and Costs. Appendix A: Auxiliary, Utility and Chemical Cost Data. Appendix B: Design Problems. Appendix C: Tables of Physical Properties and Constants. Appendix D: Conversions of SI and US Customary Units. Appendix E: Examples of Commercially Available Simulators

Chemical Reaction Engineering

International Edition

FUNDAMENTALS OF CHEMICAL REACTION ENGINEERING

by Mark Davis, California Institute of Technology and Robert Davis, University of Virginia

2003 / 4,392 pages

ISBN-13: 978-0-07-245007-1 / 0-07-245007-X

ISBN-13: 978-0-07-124642-2 / 0-07-124642-8 [IE]

CONTENTS

1 The Basics of Reaction Kinetics for Chemical Reaction Engineering. 2 Rate Constants of Elementary Reactions. 3 Reactors for Measuring Reaction Rates. 4 The Steady-State Approximation: Catalysis. 5 Heterogeneous Catalysis. 6 Effects of Transport Limitations on Rates of Solid-Catalyzed Reactions. 7 Microkinetic Analysis of Catalytic Reactions. 8 Nonideal Flow in Reactors. 9 Nonisothermal Reactors. 10 Reactor Accomplishing Heterogeneous Reactions. Appendix A Review of Chemical Equilibria. Appendix B Regression Analysis. Appendix C Transport in Porous Media

International Edition

CHEMICAL ENGINEERING KINETICS

Third Edition

by J. M. Smith, University of California, Davis

1981 / 676 pages

ISBN-13: 978-0-07-066574-3 / 0-07-066574-5 [IE]

CONTENTS

List of Symbols. 1 Introduction. 2 Chemical Kinetics. 3 Design Fundamentals and Mass Conversation and Equations for Ideal Reactors. 4 Isothermal Reactors for Homogeneous Reactions. 5 Nonisothermal Reactors. 6 Deviation From Ideal-Reactor Performance. 7 Heterogeneous Processes Catalysis and Absorption. 8 Solid Catalysts Rate Equations for Fluid-Solid Catalytic

INVITATION TO PUBLISH

McGraw-Hill is interested in reviewing manuscript for publication. Please contact your local McGraw-Hill office or email to asiapub@mcgraw-hill.com

Visit McGraw-Hill Education (Asia)

Website: www.mcgraw-hill.com.sg

Engineering Mathematics

International Edition



STATISTICS FOR ENGINEERS AND SCIENTISTS

Second Edition

By William C. Navidi. Colorado School Of Mines

2008 (January 2007) / Hardcover / 675 pages

ISBN-13: 978-0-07-330949-1 / MHID: 0-07-330949-4

ISBN-13: 978-0-07-110222-3 / MHID: 0-07-110222-1 [IE]

Navidi's Statistics for Engineers and Scientists stands out for its crystal clear presentation of applied statistics. Suitable for a one or two semester course, the book takes a practical approach to methods of statistical modeling and data analysis that are most often used in scientific work. The second edition features over 180 new homework problems as well as updates throughout including a new section on point estimation and new material on computer implementation with regards to confidence intervals. A complete media package featuring McGraw-Hill's ARIS course management system is provided for both students and instructors.

NEW TO THIS EDITION

- McGraw-Hill's ARIS online Homework Manager has been added to this edition and features algorithmic problems and gradebook capability. Instructors will have access to data sets, solutions, lecture powerpoints, and images from the text.
- Over 180 new homework problems have been added throughout.

FEATURES

- An engaging writing style explains difficult concepts clearly. While including the mathematics necessary for clear understanding, the text makes extensive use of examples to motivate fundamental concepts and to develop intuition.
- Contemporary, real world data sets are one of the defining features of this text. With a fresh approach to the subject, the author uses contemporary data sets to help motivate students and show direct connection to industry and research.
- In line with modern trends, the text contains exercises suitable for solving with computer software. These examples and exercises involve interpreting, as well as generating, computer output. The student edition of MINITAB, the widely used statistical software package, is available bundled with the text.
- A separate chapter provides extensive coverage of propagation of error, sometimes called "error analysis" or the "delta method." The coverage is more extensive than in most texts, with a flexible format allowing instructors to easily cover selected topics.
- The text presents an extensive, self-contained introduction to simulation methods at a level appropriate for introductory students, including the bootstrap and applications to estimating probabilities, estimating bias, computing confidence intervals, and testing hypotheses.
- The text provides more extensive coverage of linear model diagnostic procedures than is found in most competing texts including a lengthy section on checking model assumptions and transforming variables. The coverage emphasizes that linear models are appropriate only when the relationship between variables is linear. This point is all the more important since it is often overlooked in practice by engineers and scientists (not to mention statisticians).
- Flexible presentation of probability addresses the needs of different courses. Allowing for a mathematically rigorous approach, the major results are derived from axioms, with proofs given for most of them. Each result is illustrated with an example or two to promote intuitive understanding. Instructors who prefer a more informal approach may therefore focus on the examples rather than the proofs and skip the optional sections.

CONTENTS

1 Sampling and Descriptive Statistics. 2 Probability. 3 Propagation of Error. 4 Commonly Used Distributions. 5 Confidence Intervals. 6 Hypothesis Testing. 7 Correlation and Simple Linear Regression. 8 Multiple Regression. 9 Factorial Experiments. 10 Statistical Quality Control A Tables B Partial Derivatives C Suggestions for Further Reading Answers to Selected Exercises Index.

Professional References

PERRY'S CHEMICAL ENGINEERS' HANDBOOK

Eighth Edition

by Donald W Green, University of Kansas

2007 (April 2007) / Hardcover

ISBN-13: 978-0-07-142294-9 / MHID: 0-07-142294-3

Professional Book

Since 1934, Perry's Chemical Engineer's Handbook has delivered unrivaled, state-of-the-art coverage of all aspects of chemical engineering—from the fundamentals to details on computer applications and control. Featuring 2,400 pages and 700 illustrations, the eighth edition is a comprehensive source for the newest developments, advances, achievements, and methods in the field.

POLYMER NANOCOMPOSITES

by Joseph H. Koo

2006 / Hardcover / 272 pages

ISBN-13: 978-0-07-145821-4 / MHID: 0-07-145821-2

Professional Book

Based on the author's 26 years of experience in the field of Nanotechnology, this reference offers researchers and materials scientists a complete reference to the physical concepts, techniques, applications and principles underlying one of the most researched materials. Keeps you abreast of the latest trends, developments, and commercial applications

FEATURES

- Description of the types of nanoparticles used in polymeric matrices.
- Methods for the transformation of polymers matrix resins into nanoparticles used for coatings, adhesives, and fire resistant materials
- Chemical and electrical properties of various nanoparticles such as: carbon nanofibers, carbon nanotubes, silica, alumina
- Informs researcher of the current status, trends, new developments and commercial applications

CONTENTS

PREFACE. Chapter 1: Introduction. Chapter 2: An Overview of Nanoparticles. Chapter 3: Selecting Resin Matrix and Nanoparticles for Applications. Chapter 4: Processing of Nanomaterials. Chapter 5: Characterization of Polymer Nanomaterials. Chapter 6: Properties of Polymer Nanostructured Materials. Chapter 7: Polymer Nanostructured Materials for High-Temperature Applications. Chapter 8: Current Status, Trends, Future Directions, and Opportunities. INDEX

ENGINEERING PLASTICS HANDBOOK

by James Margolis

2006 / Hardcover / 436 pages

ISBN-13: 978-0-07-145767-5 / MHID: 0-07-145767-4

Professional Book

Product Developers have found a wide array of application for thermoplastics in the automotive interior and exterior parts, business machines, medical, telecommunications equipment, microwaveable packaging, appliances, and specialty uses. However, finding a material that can meet consumer demands is no small task. While technological information is readily available regarding the general properties of common thermoplastic material, there is no single authoritative source for building and evaluating new product lines. Written by a top team of international experts, this book will focus only on new and emerging engineering resin property requirements, instead of properties of conventional engineering thermoplastics which are available from polymer producers and compounders. This book will incorporate important chemical, physical, mechanical and applications for engineering thermoplastic in one place, providing clear solutions to evaluate and compare existing product lines and with new and emerging products.

FEATURES

- Update on the general chemistry, properties, and processes for these materials
- New advancements in materials and processes
- New applications and markets
- Single volume source for information regarding engineering resins

CONTENTS

CONTRIBUTORS. PREFACE. Part 1: Introduction. Chapter 1: Chemistry of Polymerization. Chapter 2: Products and Design. Chapter 3: Properties. Chapter 4: Processing. Part 2: Engineering Plastics. Chapter 5: Polyacetals. Chapter 6: Acrylonitrile-Butadiene-Styrene (ABS) Resin. Chapter 7: Polybutylene Terephthalate (PBT). Chapter 8: Thermoplastic Polyetherimide (PEI). Chapter 9: Polyphenylene Ether (PPE) Blends and Alloys. Chapter 10: Thermoplastic Polyimide (TPI). Chapter 11: Liquid Crystal Polymer (LCP). Chapter 12: Polyamide-Imide (PAI). Chapter 13: Polyarylethylsulfones (PAES). Chapter 14: Polycarbonates. Chapter 15: Reinforced Poly(Phenylene Sulfide). INDEX

HANDBOOK OF INDUSTRIAL CHEMISTRY

by M Farhat Ali and Bassam El Ali

2005 / 800 pages / Hardcover /

ISBN-13: 978-0-07-141037-3 / MHID: 0-07-141037-6

Professional Book

FEATURES

- Packed with chemical tables, formulae, and equations
- Covers all of the chemical process industries which utilize organic chemicals
- Reference information which ranges from basic to complex
- Physical properties for the most common organic chemicals

CONTENTS

Chapter 1: Introduction. **Chapter 2:** Safety Considerations in Process Industries. **Chapter 3:** Industrial Pollution Prevention and Waste Management. **Chapter 4:** Edible oils, fats, and waxes. **Chapter 5:** Soaps and detergents. **Chapter 6:** Sugar and other Sweeteners. **Chapter 7:** Paints, pigments and industrial coatings. **Chapter 8:** Dyestuffs, finishing and dyeing of textiles. **Chapter 9:** Industrial fermentation. **Chapter 10:** Pharmaceutical industry. **Chapter 11:** Agrochemicals. **Chapter 12:** Chemical explosives. **Chapter 13:** Petroleum processing and petrochemicals. **Chapter 14:** Polymers and plastics

HANDBOOK OF PETROCHEMICALS PRODUCTION PROCESSES

by Robert A Meyers, TRW, Inc.

2005 / 1280 pages / Hardcover

ISBN-13: 978-0-07-141042-7 / MHID: 0-07-141042-2

Professional Book

FEATURES

- General process description, including feed definition and product yield and a simplified flow diagram
- Process chemistry and thermodynamics for each major processing unit as applicable
- Process perspective. Developers, location and specification of all test and commercial plants and near term and long term plans
- Detailed process description. Process flow diagram with mass and energy balances for major process variations, and feeds and details on unique or key equipment

CONTENTS

Part One: Plastics. **Chapter 1:** Low density polyethylene. **Chapter 2:** Linear low density polyethylene. **Chapter 3:** High density polyethylene. **Chapter 4:** Polypropylene. **Chapter 5:** Polystyrene. **Chapter 6:** Acrylonitrile-butadiene-styrene. **Chapter 7:** Polyamine, nylon type. **Chapter 8:** Polyvinyl chloride and co-polymers. **Part Two:** Organic Chemicals. **Chapter 9:** Acetone. **Chapter 10:** Acrylonitrile. **Chapter 11:** Aniline. **Chapter 12:** 1, 3-Butadiene. **Chapter 13:** Cumene. **Chapter 14:** Ethylbenzene. **Chapter 15:** Ethylene. **Chapter 16:** Ethylene dichloride. **Chapter 17:** Ethylene oxide. **Chapter 18:** Methanol. **Chapter 19:** Phenol. **Chapter 20:** Propylene. **Chapter 21:** Styrene. **Chapter 22:** Urea

LANGE'S HANDBOOK OF CHEMISTRY

70th Anniversary Edition

by James Speight

2005 / Hardcover / 1,000 pages

ISBN-13: 978-0-07-143220-7 / MHID: 0-07-143220-5

Professional Book

A standard reference for chemists for 70 years, this new Sixteenth Edition features an enormous compilation of facts, data, tabular material, and experimental findings in every area of chemistry. Included in this massive compendium are listings of the properties of approximately 4,400 organic and 1,400 inorganic compounds. This Sixteenth Edition offers 40% new or extensively revised content and starting with this edition, the author includes equations that allow users to calculate important values such as temperature and pressure.

CONTENTS

Section 1 Organic Compounds. **Section 2** General Information, Conversion Tables, and Mathematics. **Section 3** Inorganic Compounds. **Section 4** Properties of Atoms, Radicals, and Bonds. **Section 5** Physical Properties. **Section 6** Thermodynamic Properties. **Section 7** Spectroscopy. **Section 8** Electrolytes, Electromotive Force, and Chemical. **Section 9** Physicochemical Relationships. **Section 10** Polymers, Rubbers, Fats, Oils, and Waxes. **Section 11** Practical Laboratory Information

HANDBOOK OF CHEMICAL ENGINEERING CALCULATIONS

Third Edition

by N P Chohey, Chemical Engineering Magazine

2004 / Hardcover / 800 pages

ISBN-13: 978-0-07-136262-7 / MHID: 0-07-136262-2

Professional Book

Fully revised and expanded, this Third Edition delivers step-by-step procedures for performing a wide array of chemical engineering calculations—along with fully worked-out examples that help you avoid costly errors. With practical techniques that help you solve problems manually, or by setting up computer-based procedures, this authoritative guide features new sections covering: * Biotechnology * Water pollution control * Chemical process plant cost engineering.

CONTENTS

Chapter 1: Physical and Chemical properties. Chapter 2: Stoichiometry. Chapter 3: Phase Equilibrium. Chapter 4: Chemical-Reaction Equilibrium. Chapter 5: Reaction Kinetics and Reactor Design. Chapter 6: Flow of Fluids and Solids. Chapter 7: Heat Transfer. Chapter 8: Distillation. Chapter 9: Extraction and Leaching. Chapter 10: Crystallization. Chapter 11: Absorption and Stripping. Chapter 12: Filtration. Chapter 13: Liquid Agitation. Chapter 14: Size reduction. Chapter 15: Air Pollution Control. Chapter 16: Other Chemical Engineering Calculations. Chapter 17: Biotechnology (as it relates to chemical engineering). Chapter 18: Water-Pollution Control. Chapter 19: Drying. Chapter 20: Absorption. Chapter 21: Cost-Engineering Calculations for Chemical-Process Plants

HANDBOOK OF PETROLEUM PROCESSES

Third Edition

by Robert A Meyers, TRW, Inc.

2004 / Hardcover / 900 pages

ISBN-13: 978-0-07-139109-2 / MHID: 0-07-139109-6

Professional Book

Handbook of Petroleum Refining Processes delivers comprehensive coverage of how major players like UOP, KBR, STRATCO, Belco, Stone & Webster, Foster Wheeler, Chevron Lummus Global, ConocoPhillips, ChevronTexaco, and Shell, are taking these processes to new heights through technology. Thoroughly revised and expanded this new edition of the Handbook of Petroleum Processes features new chapters that focus on the technological, pollution-control, and economic aspects of 61 petroleum refining processes as created by a host of industry powerhouses.

CONTENTS

Part 1: Alkylation and Polymerization. Part 2: Base Aromatics Production Processes. Part 3: Catalytic Cracking. Part 4: Catalytic Reforming. Part 5: Demydrogenation. Part 6: Hydrogen Production. Part 7: Hydrocracking. Part 8: Hydrotreating. Part 9: Isomerization. Part 10: Separation Processes. Part 11: Sulfur Compound Extraction and Sweetening. Part 12: Visbreaking and Coking. Part 13: Oxygenates Production Technologies. Part 14: Hydrogen Processing. Part 15: Gas to Liquids Technologies. Glossary. Abbreviations and Acronyms. Index

International Edition

PROPERTIES OF GAS AND LIQUIDS

Fifth Edition

by Bruce E. Poling, John M Prausnitz, University of California, Berkeley and John O'Connell

2001 / 768 pages

ISBN-13: 978-0-07-011682-5 / MHID: 0-07-011682-2

ISBN-13: 978-0-07-118971-2 / MHID: 0-07-118971-8 [IE]

Professional Book

CONTENTS

Chapter 1: The Estimation of Physical Properties. Chapter 2: Pure Component Constants. Chapter 3: Thermodynamic Properties of Ideal Gases. Chapter 4: Pressure-Volume-Temperature Relationships of Pure Gases and Liquids. Chapter 5: Pressure-Volume-Temperature Relationships of Mixtures. Chapter 6: Thermodynamic Properties of Pure Components and Mixtures. Chapter 7: Vapor Pressures and Enthalpies of Vaporization of Pure Fluids. Chapter 8: Fluid Phase Equilibria in Multicomponent Systems. Chapter 9: Viscosity. Chapter 10: Thermal Conductivity. Chapter 11: Diffusion Coefficients. Chapter 12: Surface Tension.

International Edition

SHREVE'S CHEMICAL PROCESS INDUSTRIES

Fifth Edition

by Austin G T

1984 / 864 pages

ISBN-13: 978-0-07-066167-7 / MHID: 0-07-066167-7 [IE]

Professional Book



COMPLIMENTARY COPIES

Complimentary desk copies are available for course adoption only. Kindly contact your local McGraw-Hill Representative or fax the Examination Copy Request Form available on the back pages of this catalog.

*Visit McGraw-Hill Education
Website: www.mheducation.com*

