Chemical Engineering Design Principles Practice And Economics Of Plant And Process Design

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

Principles of Chemical Engineering Processes: Material and Energy Balances introduces the basic principles and calculation techniques used in the field of chemical engineering, providing a solid understanding of the fundamentals of the application of material and energy balances. Packed with illustrative examples and case studies, this book: Discusses problems in material and energy balances related to chemical reactors Explains the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy Demonstrates how MATLAB® and Simulink® can be used to solve complicated problems of material and energy balances Shows how to solve steady-state and transient mass and energy balance problems involving multiple-unit processes and recycle, bypass, and purge streams Develops quantitative problem-solving skills, specifically the ability to think quantitatively (including numbers and units), the ability to translate words into diagrams and mathematical expressions, the ability to use common sense to interpret vague and ambiguous language in problem statements, and the ability to make judicious use of approximations and reasonable assumptions to simplify problems This Second Edition has been updated based upon feedback from professors and students. It features a new chapter related to single- and multiphase systems and contains additional solved examples and homework problems. Educational software, downloadable exercises, and a solutions manual are available with qualifying course adoption.

Written by a highly regarded author with industrial and academic experience, this new edition of an established bestselling book provides practical guidance for students, researchers, and those in chemical engineering. The book includes a new section on sustainable energy, with sections on carbon capture and sequestration, as a result of increasing environmental awareness; and a companion website that includes problems, worked solutions, and Excel spreadsheets to enable students to carry out complex calculations.

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. A Fully Updated, In-Depth Guide to Water and Wastewater Engineering Thoroughly revised to reflect the latest advances, procedures, and regulations, this authoritative resource contains comprehensive coverage of the design and construction of municipal water and wastewater facilities. Written by an environmental engineering expert and seasoned academic, Water and Wastewater Engineering: Design Principles and Practice, Second Edition, offers detailed explanations, practical strategies, and design techniques as well as hands-on safety protocols and operation and maintenance procedures. You will get cutting-edge information on water quality standards, corrosion control, piping materials, energy efficiency, direct and indirect potable reuse, and more. Coverage includes: • The design and construction processes • General water supply design considerations • Intake structures and wells • Chemical handling and storage • Coagulation and flocculation • Lime-soda and ion exchange softening • Reverse osmosis and nanofiltration • Sedimentation • Granular and membrane filtration • Disinfection and fluoridation • Removal of specific constituents • Water plant residuals management, process selection, and integration • Storage and distribution systems • Wastewater collection and treatment design considerations • Sanitary sewer design • Headworks and preliminary treatment • Primary treatment • Wastewater microbiology • Secondary treatment by suspended growth biological processes • Secondary treatment by attached growth and hybrid biological processes • Tertiary treatment • Advanced oxidation processes • Direct and indirect potable reuse

Chemical Engineering Design and Analysis
Principles of Chemical Engineering Processes
The Industrial Practice of Chemical Process Engineering
An Introduction
Chemical Engineering Primer with Computer Applications
Chemical Process Engineering

Combines academic theory with practical industry experience Updated to include the latest regulations and references Covers hazard identification, risk assessment, and inherent safety Case studies and problem sets enhance learning Long-awaited revision of the industry best seller. This fully revised second edition of Chemical Process Safety: Fundamentals with Applications combines rigorous academic methods with real-life industrial experience to create a unique resource for students and professionals alike. The primary focus on technical fundamentals of chemical process safety provides a solid groundwork for understanding, with full coverage of both prevention and mitigation measures. Subjects include: Toxicology and industrial hygiene Vapor and liquid releases and dispersion modeling Flammability characterization Relief and explosion venting In addition to an overview of government regulations, the book introduces the resources of the AICHE Center for Chemical Process Safety library. Guidelines are offered for hazard identification and risk assessment. The book concludes with case histories drawn directly from the authors' experience in the field. A perfect reference for industry professionals, Chemical Process Safety: Fundamentals with Applications, Second Edition is also ideal for teaching at the graduate and senior undergraduate levels. Each chapter includes 30 problems, and a solutions manual is now available for instructors.

The field of chemical engineering is undergoing a global “renaissance,” with new processes, equipment, and sources changing literally every day. It is a dynamic, important area of study and the basis for some of the most lucrative and integral fields of science. Introduction to Chemical Engineering offers a comprehensive overview of the concept, principles and applications of chemical engineering. It explains the distinct chemical engineering knowledge which gave rise to a general-purpose technology and broadest engineering field. The book serves as a conduit between college education and the real-world chemical engineering practice. It answers many questions students and young engineers often ask which include: How is what I studied in the classroom being applied in the industrial setting? What steps do I need to take to become a professional chemical engineer? What are the career diversities in chemical engineering and the engineering knowledge required? How is chemical engineering design done in real-world? What are the chemical engineering computer tools and their applications? What are the prospects, present and future challenges of chemical engineering? And so on. It also provides the information new chemical engineering hires would need to excel and cross the critical novice engineer stage of their career. It is expected that this book will enhance students understanding and performance in the field and the development of the profession worldwide. Whether a new-hire engineer or a veteran in the field, this is a must—have volume for any chemical engineer’s library.

Slurry Flow: Principles and Practice describes the basic concepts and methods for understanding and designing slurry flow systems, in-plan installations, and long-distance transportation systems. The goal of this book is to enable the design or plant engineer to derive the maximum benefit from a limited amount of test data and to generalize operating experience to new situations. Design procedures are described in detail and are accompanied by illustrative examples needed by engineers with little or no previous experience in slurry transport. The technical literature in this field is extensive: this book facilitates its use by surveying current research results and providing explanations of mechanistic flow models. This discussion of background scientific principles helps the practitioner to better interpret test data, select pumps, specify materials of construction, and choose measuring devises for slurry transport systems. The extensive range of topics covered in Slurry Flow: Principles and practice includes slurry rheology, homogeneous and heterogeneous slurry flow principles, wear mechanisms, pumping equipment, instrumentation, and operating aspects.

An introduction to the art and practice of design as applied to chemical processes and equipment. It is intended primarily as a text for chemical engineering students undertaking the design projects that are set as part of undergraduate courses in chemical engineering in the UK and USA. It has been written to complement the treatment of chemical engineering fundamentals given in Chemical Engineering volumes 1, 2 and 3. Examples are given in each chapter to illustrate the design methods presented.

Analysis, Synthesis and Design of Chemical Processes
Coulson & Richardson's Chemical Engineering
A Case Study Approach, Second Edition
For Chemical Engineers and Students
Elements of Chemical Reaction Engineering
Water and Wastewater Engineering: Design Principles and Practice, Second Edition

This volume of case studies serves as a guide and reference manual for the application of engineering science fundamentals in the solution of chemical development and process design problems. The introductory chapter describes a set of general principles relevant to the analysis of industrial design problems. An extensive bibliography is presented which provides a valuable theoretical and practical basis for proper understanding of the case studies.The six case studies present an opportunity for the detailed application of the broad principles outlined in the introduction. These cases vary widely both in regard to the engineering operations analyzed and with respect to the complexity and detail of the required solution. Three of the analyses result in computer programs which may be utilized for a more comprehensive design evaluation and for student discussion in a "computerized classroom."Each case represents a useful approach to a general class of design studies, and each has been reviewed by an industrial or academic expert familiar with current commercial practice. Therefore, even though the reproduction of specific industrial designs has not been attempted, each solution has been compared and contrasted with the realities of modern industrial operations.Various approaches to the financial evaluation of a chemical project are described. These are presented in some detail since material of this type is frequently absent from academic curricula.

Up-to-Date Coverage of All Chemical Engineering Topics—from the Fundamentals to the State of the Art Now in its 85th Anniversary Edition, this industry-standard resource has equipped generations of engineers and chemists with vital information, data, and insights. Thoroughly revised to reflect the latest technological advances and processes, Perry's Chemical Engineers' Handbook, Ninth Edition, provides unsurpassed coverage of every aspect of chemical engineering. You will get comprehensive details on chemical processes, reactor modeling, biological processes, biochemical and membrane separation, process and chemical plant safety, and much more. This fully updated edition covers: Unit Conversion Factors and Symbols • Physical and Chemical Data including Prediction and Correlation of Physical Properties • Mathematics including Differential and Integral Calculus, Statistics , Optimization • Thermodynamics • Heat and Mass Transfer • Fluid and Particle Dynamics "Reaction Kinetics • Process Control and Instrumentation• Process Economics • Transport and Storage of Fluids • Heat Transfer Operations and Equipment • Psychrometry, Evaporative Cooling, and Solids Drying • Distillation • Gas Absorption and Gas-Liquid System Design • Liquid-Liquid Extraction Operations and Equipment • Adsorption and Ion Exchange • Gas-Solid Operations and Equipment • Liquid-Solid Operations and Equipment •Chemical Reactors • Bio-based Reactions and Processing • Waste Management including Air ,Wastewater and Solid Waste Management" Process Safety including Inherently Safer Design • Energy Resources, Conversion and Utilization" Materials of Construction

“Bottom line: For a holistic view of chemical engineering design, this book provides as much, if not more, than any other book available on the topic.’ Extract from Chemical Engineering Resources review. Chemical Engineering Design is a complete course text for students of chemical engineering. Written for the Senior Design Course, and also suitable for introduction to chemical engineering courses, it covers the basics of unit operations and the latest aspects of process design, equipment selection, plant and operating economics, safety and loss prevention. It is a textb.

This is a free sample chapter from a short book on chemical process design. The book derives from a course on chemical process design that I taught at the University of Cambridge, UK, between 2008 and 2018 and is intended to serve as a basic introduction to a number of disciplines within the topic. Given the immense breadth and depth of this subject, the aim of this book is to introduce and illustrate certain key points and concepts and to provide a template ‘workflow’ for certain procedures such as gaseous relief header design or distillation optimisation. Reference is made to specialist design manuals for specific topics such that more information can be obtained by the reader where necessary. The aim of this book is not to provide a definitive reference for all design scenarios but rather to act as an introductory guide! The book was originally written for undergraduate students embarking on their design project, but it is also intended to serve as a succinct reference guide to existing practitioners.

Phase Equilibria in Chemical Engineering
Process Equipment and Plant Design
Chemical Process Safety
Principles, Practice and Economics of Plant and Process Design
Rules of Thumb for Chemical Engineers
Process Engineering and Design Using Visual Basic®, Second Edition

Chemical Engineering DesignPrinciples, Practice and Economics of Plant and Process DesignElsevier

Chemical Process Engineering presents a systematic approach to solving design problems by listing the needed equations, calculating degrees-of-freedom, developing calculation procedures to generate process specifications- mostly pressures, temperatures, compositions, and flow rates- and sizing equipment. This illustrative reference/text tabulates numerous easy-to-follow calculation procedures as well as the relationships needed for sizing commonly used equipment.

*Chemical Engineering Volume 2 covers the properties of particulate systems, including the character of individual particles and their behaviour in fluids. Sedimentation of particles, both singly and at high concentrations, flow in packed and fluidised beads and filtration are then examined. The latter part of the book deals with separation processes, such as distillation and gas absorption, which illustrate applications of the fundamental principles of mass transfer introduced in Chemical Engineering Volume 1. In conclusion, several techniques of growing importance - adsorption, ion exchange, chromatographic and membrane separations, and process intensification - are described. * A logical progression of chemical engineering concepts, volume 2 builds on fundamental principles contained in Chemical Engineering volume 1 and these volumes are fully cross-referenced * Reflects the growth in complexity and stature of chemical engineering over the last few years * Supported with further reading at the end of each chapter and graded problems at the end of the book*

Part I: Process design -- Introduction to design -- Process flowsheet development -- Utilities and energy efficient design -- Process simulation -- Instrumentation and process control -- Materials of construction -- Capital cost estimating -- Estimating revenues and production costs -- Economic evaluation of projects -- Safety and loss prevention -- General site considerations -- Optimization in design -- Part II: Plant design -- Equipment selection, specification and design -- Design of pressure vessels -- Design of reactors and mixers -- Separation of fluids -- Separation columns (distillation, absorption and extraction) -- Specification and design of solids-handling equipment -- Heat transfer equipment -- Transport and storage of fluids.

A Manual of Quick, Accurate Solutions to Everyday Process Engineering Problems
Chemical Engineering Design
Principles and Practice
Fundamentals of Process Safety Engineering
Design And Economics
Green Chemistry and Engineering

Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780750684231 .

Chemical Engineering Design is one of the best-known and widely adopted texts available for students of chemical engineering. It deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, the fourth edition covers the latest aspects of process design, operations, safety, loss prevention and equipment selection, among others. Comprehensive and detailed, the book is supported by problems and selected solutions. In addition the book is widely used by professionals as a day-to-day reference. Best selling chemical engineering text Revised to keep pace with the latest chemical industry changes; designed to see students through from undergraduate study to professional practice End of chapter exercises and solutions

This 1998 book introduces the basics of engineering design and analysis for beginning chemical engineering undergraduate students.

Neural networks have received a great deal of attention among scientists and engineers. In chemical engineering, neural computing has moved from pioneering projects toward mainstream industrial applications. This book introduces the fundamental principles of neural computing, and is the first to focus on its practical applications in bioprocessing and chemical engineering. Examples, problems, and 10 detailed case studies demonstrate how to develop, train, and apply neural networks. A disk containing input data files for all illustrative examples, case studies, and practice problems provides the opportunity for hands-on exercise. An important goal of the book is to help the student or practitioner learn and implement neural networks quickly and inexpensively using commercially available, PC-based software tools. Detailed network specifications and training procedures are included for all neural network examples discussed in the book. Each chapter contains an introduction, chapter summary, references to further reading, practice problems, and a section on nomenclature Includes a PC-compatible disk containing input data files for examples, case studies, and practice problems Presents 10 detailed case studies Contains an extensive glossary, explaining terminology used in neural network applications in science and engineering Provides examples, problems, and ten detailed case studies of neural computing applications, including: Process fault-diagnosis of a chemical reactor Leonard Kramer fault-classification problem Process fault-diagnosis for an unsteady-state continuous stirred-tank reactor system Classification of protein secondary-structure categories Quantitative prediction and regression analysis of complex chemical kinetics Software-based sensors for quantitative predictions of product compositions from flourescent spectra in bioprocessing Quality control and optimization of an autoclave curing process for manufacturing composite materials Predictive modeling of an experimental batch fermentation process Supervisory control of the Tennessee Eastman plantwide control problem Predictive modeling and optimal design of extractive bioseparation in aqueous two-phase systems

Principles, Practice and Economics of Plant and Process Design by Gavin Towler, ISBN
An Introduction to Chemical Process Design - free sample chapter
A Practical Design Approach
Systematic Methods of Chemical Process Design
Studyguide for Chemical Engineering Design
Introduction to Chemical Engineering: Tools for Today and Tomorrow, 5th Edition

Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design is one of the best-known and most widely adopted texts available for students of chemical engineering. The text deals with the application of chemical engineering principles to the design of chemical processes and equipment. The third edition retains its hallmark features of scope, clarity and practical emphasis, while providing the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards, as well as coverage of the latest aspects of process design, operations, safety, loss prevention, equipment selection, and more. The text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken), and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). Provides students with a text of unmatched relevance for chemical process and plant design courses and for the final year capstone design course Written by practicing design engineers with extensive undergraduate teaching experience Contains more than 100 typical industrial design projects drawn from a diverse range of process industries NEW TO THIS EDITION Includes new content covering food, pharmaceutical and biological processes and commonly used unit operations Provides updates on plant and equipment costs, regulations and technical standards Includes limited online access for students to Cost Engineering's Cleopatra Enterprise cost estimating software

Process Plant Layout, Second Edition, explains the methodologies used by professional designers to layout process equipment and pipework, plots, plants, sites, and their corresponding environmental features in a safe, economical way. It is supported with tables of separation distances, rules of thumb, and codes of practice and standards. The book includes more than seventy-five case studies on what can go wrong when layout is not properly considered. Sean Moran has thoroughly rewritten and re-illustrated this book to reflect advances in technology and best practices, for example, changes in how designers balance layout density with cost, operability, and safety considerations. The content covers the 'why' underlying process design company guidelines, providing a firm foundation for career growth for process design engineers. It is ideal for process plant designers in contracting, consultancy, and for operating companies at all stages of their careers, and is also of importance for operations and maintenance staff involved with a new build, guiding them through plot plan reviews. Based on interviews with over 200 professional process plant designers Explains multiple plant layout methodologies used by professional process engineers, piping engineers, and process architects Includes advice on how to choose and use the latest CAD tools for plant layout Ensures that all methodologies integrate to comply with worldwide risk management legislation

Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes is an edited collection of contributions from leaders in their field. It takes a holistic view of sustainability in chemical and process engineering design, and incorporates economic analysis and human dimensions. Ruiz-Mercado and Cabezas have brought to this book their experience of researching sustainable process design and life cycle sustainability evaluation to assist with development in government, industry and academia. This book takes a practical, step-by-step approach to designing sustainable plants and processes by starting from chemical engineering fundamentals. This method enables readers to achieve new process design approaches with high influence and less complexity. It will also help to incorporate sustainability at the early stages of project life, and build up multiple systems level perspectives. Ruiz-Mercado and Cabezas' book is the only book on the market that looks at process sustainability from a chemical engineering fundamentals perspective. Improve plants, processes and products with sustainability in mind; from conceptual design to life cycle assessment Avoid retro fitting costs by planning for sustainability concerns at the start of the design process Link sustainability to the chemical engineering fundamentals

An Applied Guide to Process and Plant Design, 2nd edition, is a guide to process plant design for both students and professional engineers. The book covers plant layout and the use of spreadsheet programs and key drawings produced by professional engineers as aids to design; subjects that are usually learned on the job rather than in education. You will learn how to produce smarter plant design through the use of computer tools, including Excel and AutoCAD, “What If Analysis, statistical tools, and Visual Basic for more complex problems. The book also includes a wealth of selection tables, covering the key aspects of professional plant design which engineering students and early-career engineers tend to find most challenging. Professor Moran draws on over 20 years’ experience in process design to create an essential foundational book ideal for those who are new to process design, compliant with both professional practice and the IChemE degree accreditation guidelines. Includes new and expanded content, including illustrative case studies and practical examples Explains how to deliver a process design that meets both business and safety criteria Covers plant layout and the use of spreadsheet programs and key drawings as aids to design Includes a comprehensive set of selection tables, covering aspects of professional plant design which early-career designers find most challenging

Principles, Practice, and Economics of Plant and Process Design
Introduction to Chemical Engineering
Outlines and Highlights for Chemical Engineering Design
Carbon Dioxide Electrochemistry
Fundamentals with Applications
Tools for Today and Tomorrow

The Leading Integrated Chemical Process Design Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details–and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process troubleshooting and “debottlenecking” Chemical engineering design and society: ethics, professionalism, health, safety, and new “green engineering” techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and appendixes with current equipment cost data and preliminary design information for eleven chemical processes–including seven brand new to this edition.

This new edition follows the original format, which combines a detailed case study - the production of phthalic anhydride - with practical advice and comprehensive background information. Guiding the reader through all major aspects of a chemical engineering design, the text includes both the initial technical and economic feasibility study as well as the detailed design stages. Each aspect of the design is illustrated with material from an award-winning student design project. The book embodies the "learning by doing" approach to design. The student is directed to appropriate information sources and is encouraged to make decisions at each stage of the design process rather than simply following a design method. Thoroughly revised, updated, and expanded, the accompanying text includes developments in important areas and many new references.

The most complete guide of its kind, this is the standard handbook for chemical and process engineers. All new material on fluid flow, long pipe, fractionators, separators and accumulators, cooling towers, gas treating, blending, troubleshooting field cases, gas solubility, and density of irregular solids. This substantial addition of material will also include conversion tables and a new appendix, “Shortcut Equipment Design Methods.”This convenient volume helps solve field engineering problems with its hundreds of common sense techniques, shortcuts, and calculations. Here, in a compact, easy-to-use format, are practical tips, handy formulas, correlations, curves, charts, tables, and shortcut methods that will save engineers valuable time and effort. Hundreds of common sense techniques and calculations help users quickly and accurately solve day-to-day design, operations, and equipment problems.

This textbook covers the essential aspects of process safety engineering in a practical and comprehensive manner. It provides readers with an understanding of process safety hazards in the refining and petrochemical industries and how to manage them in a reliable and professional manner. It covers the most important concepts: static electricity, intensity of thermal radiation, thermodynamics of fluid phase equilibria, boiling liquid expanding vapor explosion (BLEVE), emission source models, hazard identification methods, risk control and methods for achieving manufacturing excellence while also focusing on safety. Extensive case studies are included. Aimed at senior undergraduate and graduate chemical engineering students and practicing engineers, this book covers process safety principles and engineering practice authoritatively, with comprehensive examples: • Fundamentals, methods, and procedures for the industrial practice of process safety engineering. • The thermodynamic fundamentals and computational methods for release rates from ruptures in pipelines, vessels, and relief valves. • Fundamentals of static electricity hazards and their mitigation. • Quantitative assessment of fires and explosions. • Principles of dispersion calculations for toxic or flammable gases and vapors. • Methods of qualitative and quantitative risk assessment and control.

Material and Energy Balances, Second Edition

Principles and Practices
Neural Networks in Bioprocessing and Chemical Engineering
Occupational Outlook Handbook
Perry's Chemical Engineers' Handbook, 9th Edition

This concise book is a broad and highly motivational introduction for first-year engineering students to the exciting of field of chemical engineering. The material in the text is meant to precede the traditional second-year topics. It provides students with, 1) materials to assist them in deciding whether to major in chemical engineering; and 2) help for future chemical engineering majors to recognize in later courses the connections between advanced topics and relationships to the whole discipline. This text, or portions of it, may be useful for the chemical engineering portion of a broader freshman level introduction to engineering course that examines multiple engineering fields.

Phase Equilibria in Chemical Engineering is devoted to the thermodynamic basis and practical aspects of the calculation of equilibrium conditions of multiple phases that are pertinent to chemical engineering processes. Efforts have been made throughout the book to provide guidance to adequate theory and practice. The book begins with a long chapter on equations of state, since it is intimately bound up with the development of thermodynamics. Following material on basic thermodynamics and nonidealities in terms of fugacities and activities, individual chapters are devoted to equilibria primarily between pairs of phases. A few topics that do not fit into these categories and for which the state of the art is not yet developed quantitatively have been relegated to a separate chapter. The chapter on chemical equilibria is pertinent since many processes involve simultaneous chemical and phase equilibria. Also included are chapters on the evaluation of enthalpy and entropy changes of nonideal substances and mixtures, and on experimental methods. This book is intended as a reference and self-study as well as a textbook either for full courses in phase equilibria or as a supplement to related courses in the chemical engineering curriculum. Practicing engineers concerned with separation technology and process design also may find the book useful.

Homogeneous and Heterogeneous Catalysis

“The fourth edition of Elements of Chemical Reaction Engineering is a completely revised version of the book. It combines authoritative coverage of the principles of chemical reaction engineering with an unsurpassed focus on critical thinking and creative problem solving, employing open-ended questions and stressing the Socratic method. Clear and organized, it integrates text, visuals, and computer simulations to help readers solve even the most challenging problems through reasoning, rather than by memorizing equations."--BOOK JACKET.

Chemical Process Design and Integration
Chemical Engineering
Industrial Process Engineering and Plant Design
Slurry Flow
An Introduction to Chemical Engineering Design
Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes

Enables chemical engineering students to bridge theory andpractice Integrating scientific principles with practical engineeringexperience, this text enables readers to master the fundamentals ofchemical processing and apply their knowledge of such topics asmaterial and energy balances, transport phenomena, reactor design,and separations across a broad range of chemical industries. Theauthor skillfully guides readers step by step through the executionof both chemical process analysis and equipment design. Principles of Chemical Engineering Practice is dividedinto two sections: the Macroscopic View and the Microscopic View.The Macroscopic View examines equipment design and behavior fromthe vantage point of inlet and outlet conditions. The MicroscopicView is focused on the equipment interior resulting from conditionsprevailing at the equipment boundaries. As readers progress throughthe text, they'll learn to master such chemical engineeringoperations and equipment as: Separators to divide a mixture into parts with desirableconcentrations Reactors to produce chemicals with needed properties Pressure changers to create favorable equilibrium and rateconditions Temperature changers and heat exchangers to regulate and changethe temperature of process streams Throughout the book, the author sets forth examples that referto a detailed simulation of a process for the manufacture ofacrylic acid that provides a unifying thread for equipment sizingin context. The manufacture of hexyl glucoside provides a threadfor process design and synthesis. Presenting basic thermodynamics, Principles of ChemicalEngineering Practice enables students in chemical engineeringand related disciplines to master and apply the fundamentals and toproceed to more advanced studies in chemical engineering.

Over the last 20 years, fundamental design concepts and advanced computer modeling have revolutionized process design for chemical engineering. Team work and creative problem solving are still the building blocks of successful design, but new design concepts and novel mathematical programming models based on computer-based tools have taken out much of the guess-work. This book presents the new revolutionary knowledge, taking a systematic approach to design at all levels.

Software tools are a great aid to process engineers, but too much dependence on such tools can often lead to inappropriate and suboptimal designs. Reliance on software is also a hindrance without a firm understanding of the principles underlying its operation, since users are still responsible for devising the design. In Process Engineering and Design Using Visual Basic, Arun K. Datta provides a unique and versatile suite of programs along with simultaneous development of the underlying concepts, principles, and mathematics. Each chapter details the theory and techniques that provide the basis for design and engineering software and then showcases the development and utility of programs developed using the material outlined in the chapter. This all-inclusive guide works systematically from basic mathematics to fluid mechanics, separators, overpressure protection, and glycol dehydration, providing basic design guidelines based on international codes. Worked examples demonstrate the utility of each program, while the author also explains problems and limitations associated with the simulations. After reading this book you will be able to immediately put these programs into action and have total confidence in the result, regardless of your level of experience. Companion Visual Basic and Excel files are available for download on under the "Downloads/Updates" tab on this web page.

"The book provides the whole horizon of process engineering and plant design from concept phase through the execution to commissioning of the plant in the real practice. Providing a complete industrial perspective. The book covers the pertinent guidelines and standards and how engineering documents are generated using these standards with topics as Hazardous Area Classification, Relief System Design, Revamp Engineering, Interaction with Other Disciplines, and Pre-commissioning and Commissioning. The concepts are supported by illustrated practical examples. It also deals with decision making processes on strategic level, management tasks and leading functions beside the technical know-how"--

Principles, Practice and Economics of Plant and Process Design by Towler, Gavin
Principles of Chemical Engineering Practice
Chemical Engineering Design Project
Process Plant Layout
An Applied Guide to Process and Plant Design

Never HIGHLIGHT a Book Again Includes all testable terms, concepts, persons, places, and events. Cram101 Just the FACTS101 studyguides gives all of the outlines, highlights, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanies: 9780872893795. This item is printed on demand.

Process Equipment and Plant Design: Principles and Practices takes a holistic approach towards process design in the chemical engineering industry, dealing with the design of individual process equipment and its configuration as a complete functional system. Chapters cover typical heat and mass transfer systems and equipment included in a chemical engineering curriculum, such as heat exchangers, heat exchanger networks, evaporators, distillation, absorption, adsorption, reactors and more. The authors expand on additional topics such as industrial cooling systems, extraction, and topics on process utilities, piping and hydraulics, including instrumentation and safety basics that supplement the equipment design procedure and help to arrive at a complete plant design. The chapters are arranged in sections pertaining to heat and mass transfer processes, reacting systems, plant hydraulics and process vessels, plant auxiliaries, and engineered safety as well as a separate chapter showcasing examples of process design in complete plants. This comprehensive reference bridges the gap between industry and academia, while exploring best practices in design, including relevant theories in process design making this a valuable primer for fresh graduates and professionals working on design projects in the industry. Serves as a consolidated resource for process and plant design, including process utilities and engineered safety Bridges the gap between industry and academia by including practices in design and summarizing relevant theories Presents design solutions as a complete functional system and not merely the design of major equipment Provides design procedures as pseudo-code/flow-chart, along with practical considerations

Taking a highly pragmatic approach to presenting the principles and applications of chemical engineering, this companion text for students and working professionals offers an easily accessible guide to solving problems using computers. The primer covers the core concepts of chemical engineering, from conservation laws all the way up to chemical kinetics, without heavy stress on theory and is designed to accompany traditional larger core texts. The book presents the basic principles and techniques of chemical engineering processes and helps readers identify typical problems and how to solve them. Focus is on the use of systematic algorithms that employ numerical methods to solve different chemical engineering problems by describing and transforming the information. Problems are assigned for each chapter, ranging from simple to difficult, allowing readers to gradually build their skills and tackle a broad range of problems. MATLAB and Excel® are used to solve many examples and the more than 70 real examples throughout the book include computer or hand solutions, or in many cases both. The book also includes a variety of case studies to illustrate the concepts and a downloadable file containing fully worked solutions to the book’s problems on the publisher’s website. Introduces the reader to chemical engineering computation without the distractions caused by the contents found in many texts. Provides the principles underlying all of the major processes a chemical engineer may encounter as well as offers insight into their analysis, which is essential for design calculations. Shows how to solve chemical engineering problems using computers that require numerical methods using standard algorithms, such as MATLAB® and Excel®. Contains selective solved examples of many problems within the chemical process industry to demonstrate how to solve them using the techniques presented in the text. Includes a variety of case studies to illustrate the concepts and a downloadable file containing fully worked solutions to problems on the publisher’s website. Offers non-chemical engineers who are expected to work with chemical engineers on projects, scale-ups and process evaluations a solid understanding of basic concepts of chemical engineering analysis, design, and calculations.

The past, present, and future of green chemistry and greenengineering From college campuses to corporations, the past decade witnesseda rapidly growing interest in understanding sustainable chemistryand engineering. Green Chemistry and Engineering: A PracticalDesign Approach integrates the two disciplines into a singlestudy tool for students and a practical guide for working chemistsand engineers. In Green Chemistry and Engineering, theauthors—each highly experienced in implementing greenchemistry and engineering programs in industrialsettings—provide the bottom-line thinking required to notonly bring sustainable chemistry and engineering closer together,but to also move business towards more sustainable practices andproducts. Detailing an integrated, systems-oriented approach thatbridges both chemical syntheses and manufacturing processes, thisinvaluable reference covers: Green chemistry and green engineering in the movement towardssustainability Designing greener, safer chemical synthesis Designing greener, safer chemical manufacturing processes Looking beyond current processes to a lifecycle thinkingperspective Trends in chemical processing that may lead to more sustainablepractices The authors also provide real-world examples and exercises topromote further thought and discussion. The EPA defines green chemistry as the design of chemicalproducts and processes that reduce or eliminate the use orgeneration of hazardous substances. Green engineering is describedas the design, commercialization, and use of products and processesthat are feasible and economical while minimizing both thegeneration of pollution at the source and the risk to human healthand the environment. While there is no shortage of books on eitherdiscipline, Green Chemistry and Engineering is the first totruly integrate the two.