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Food Process Design - Zacharias B. Maroulis 2003-05-09

This timely reference utilizes simplified computer strategies to analyze, develop, and optimize industrial food processes and offers procedures to assess various operating conditions, engineering and economic relationships, and the physical and transport properties of foods for the design of the most efficient food manufacturing technologies and eq

Separation Processes in Biotechnology - Juan A. Asenjo 2020-08-26

Edited to avoid duplication and favor comprehensiveness, 20 contributors detail the recovery, separation, and purification operations of bioprocess technology. Individual chapters in this classic yet still highly relevant work emphasize concepts that are becoming more and more important when applied to the large scale versions of techniques that are considered well established. Aside from fully discussing processes, Separation Processes in Biotechnology includes sections on concentration separation and operation, purification operations, and product release and recovery. It also discusses plant operation and equipment and delves into economic considerations

Differential Evolution In Chemical Engineering: Developments And Applications - Gade Pandu Rangaiah 2017-05-29

Optimization plays a key role in the design, planning and operation of chemical and related processes for several decades. Techniques for solving optimization problems are of deterministic or stochastic type. Of these, stochastic techniques can solve any type of optimization problems and can be adapted for multiple objectives. Differential evolution (DE), proposed about two decades ago, is one of the stochastic techniques. Its algorithm is simple to understand and use. DE has found many applications in chemical engineering. This unique compendium focuses on DE, its recent developments and applications in chemical engineering. It will cover both single and multi-objective optimization. The book contains a number of chapters from experienced editors, and also several chapters from active researchers in this area.

Encyclopedia of Computer Science and Technology - Jack Belzer 1977-05-01

"This comprehensive reference work provides immediate, fingertip access to state-of-the-art technology in nearly 700 self-contained articles written by over 900 international authorities. Each article in the Encyclopedia features current developments and trends in computers, software, vendors, and applications...extensive bibliographies of leading figures in the field, such as Samuel Alexander, John von Neumann, and Norbert Wiener...and in-depth analysis of future directions."

Process Industry Economics - David J. Brennan 1998

Research and Development Progress Report - United States. Office of Saline Water 1971

Project Engineering Primer for Chemical Engineers - Sampa Chakrabarti 2022-03-21

This book discusses financial, managerial and engineering aspects associated with project engineering. The book is a text/reference book on courses related to project engineering for undergraduate students of Chemical Engineering programmes. The author has utilized her decade-long professional experience with reputed project consultancy organizations and her academic experience in writing this book. The background of project engineering is described with special emphasis on its interdisciplinary nature. Project management techniques are discussed with the help of worked-out examples. It includes multiple choice questions and information regarding relevant courses in different institutes. The book is useful for undergraduate degree and diploma students as well as for fresh graduate engineering trainees in various

process consulting organizations.

Mechanical Engineering News - 1970

Chemical Engineering - Ray Sinnott 2013-10-22

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.

Life Cycle Costing - B. S. Dhillon 1989

Evaluating the cost of acquiring major pieces of equipment also necessitates costing their life maintenance. Providing coverage of recent advances in this field, this book covers such topics as reliability improvement warranty, computer hardware/software costing, and reliability engineering.

Crystallization Process Systems - Alan G. Jones 2002-04-24

Particulate Crystal Characteristics; Fluid-particle Transport Processes; Crystallization Principles and Techniques; Crystal Formation Processes; Crystallizer Design and Operation; Solid-Liquid Separation Processes; Design of Crystallization Process Systems.

A Distributed Coordination Approach to Reconfigurable Process Control - Nirav Chokshi 2007-11-21

Success in the continuous process industries depends upon the ability to adapt to the demands of global supply chains in real-time. Thus, process plants must be designed to be easily reconfigured as and when necessary. "A Distributed Coordination Approach to Reconfigurable Process Control" presents research that addresses this issue, via developing a new distributed framework that will enable the building of a process control system that is capable of reconfigurability. This framework views the process as a set of readily-integrated, modular process elements, which operate relatively independently and are each supported by a degree of stand-alone decision-making capability. The rationale and benefits of moving towards the new approach is demonstrated by means of a worked example of a real process plant. The research will also help end-users to gain an understanding of the economic aspects of material flows across their plants, and the ways in which their processes can be integrated across the enterprise.

Lees' Loss Prevention in the Process Industries - Frank Lees 2005-01-25

Over the last three decades the process industries have grown very rapidly, with corresponding increases in the quantities of hazardous materials in process, storage or transport. Plants have become larger and are often situated in or close to densely populated areas. Increased hazard of loss of life or property is continually highlighted with incidents such as Flixborough, Bhopal, Chernobyl, Three Mile Island, the Phillips 66 incident, and Piper Alpha to name but a few. The field of Loss Prevention is, and continues to, be of supreme importance to countless companies, municipalities and governments around the world, because of the trend for processing plants to become larger and often be situated in or close to densely populated areas, thus increasing the hazard of loss of life or property. This book is a detailed guidebook to defending against these, and many other, hazards. It could without exaggeration be referred to as the "bible" for the process industries. This is THE standard reference work for chemical and process engineering safety professionals. For years, it has been the most complete collection of information on the theory, practice, design elements, equipment,

regulations and laws covering the field of process safety. An entire library of alternative books (and cross-referencing systems) would be needed to replace or improve upon it, but everything of importance to safety professionals, engineers and managers can be found in this all-encompassing reference instead. Frank Lees' world renowned work has been fully revised and expanded by a team of leading chemical and process engineers working under the guidance of one of the world's chief experts in this field. Sam Mannan is professor of chemical engineering at Texas A&M University, and heads the Mary Kay O'Connor Process Safety Center at Texas A&M. He received his MS and Ph.D. in chemical engineering from the University of Oklahoma, and joined the chemical engineering department at Texas A&M University as a professor in 1997. He has over 20 years of experience as an engineer, working both in industry and academia. New detail is added to chapters on fire safety, engineering, explosion hazards, analysis and suppression, and new appendices feature more recent disasters. The many thousands of references have been updated along with standards and codes of practice issued by authorities in the US, UK/Europe and internationally. In addition to all this, more regulatory relevance and case studies have been included in this edition. Written in a clear and concise style, *Loss Prevention in the Process Industries* covers traditional areas of personal safety as well as the more technological aspects and thus provides balanced and in-depth coverage of the whole field of safety and loss prevention. * A must-have standard reference for chemical and process engineering safety professionals * The most complete collection of information on the theory, practice, design elements, equipment and laws that pertain to process safety * Only single work to provide everything; principles, practice, codes, standards, data and references needed by those practicing in the field

Knowledge-Based Intelligent Information and Engineering Systems - Mircea Gh. Negoita 2004-10-14

We were very pleased to once again extend to the delegates and, we are pleased to say, our friends the warmest of welcomes to the 8 International Conference on Knowledge-Based Intelligent Information and Engineering Systems at Wellington - Institute of Technology in Wellington, New Zealand. The KES conferences attract a wide range of interest. The broad focus of the conference series is the theory and applications of computational intelligence and emergent technologies. Once purely a research field, intelligent systems have advanced to the point where their abilities have been incorporated into many conventional application areas. The quest to encapsulate human knowledge and capabilities in domains such as reasoning, problem solving, sensory analysis, and other complex areas has been avidly pursued. This is because it has been demonstrated that these abilities have definite practical applications. The techniques long ago reached the point where they are being exploited to provide commercial advantages for companies and real beneficial effects on profits. KES 2004 provided a valuable mechanism for delegates to obtain a profound view of the latest intelligent systems research into a range of algorithms, tools and techniques. KES 2004 also gave delegates the chance to come into contact with those applying intelligent systems in diverse commercial areas. The combination of theory and practice represents a uniquely valuable opportunity for appreciating the full spectrum of intelligent-systems activity and the "state of the art".

Distillation: Fundamentals and Principles - Andrzej Gorak 2014-07-22

Distillation: Fundamentals and Principles — winner of the 2015 PROSE Award in Chemistry & Physics — is a single source of authoritative information on all aspects of the theory and practice of modern distillation, suitable for advanced students and professionals working in a laboratory, industrial plants, or a managerial capacity. It addresses the most important and current research on industrial distillation, including all steps in process design (feasibility study, modeling, and experimental validation), together with operation and control aspects. This volume features an extra focus on the conceptual design of distillation. Winner of the 2015 PROSE Award in Chemistry & Physics from the Association of American Publishers Practical information on the newest development written by recognized experts Coverage of a huge range of laboratory and industrial distillation approaches Extensive references for each chapter facilitates further study

Global Optimization in Engineering Design - Ignacio E. Grossmann 2013-04-17

Mathematical Programming has been of significant interest and relevance in engineering, an area that is very rich in challenging optimization problems. In particular, many design and operational

problems give rise to nonlinear and mixed-integer nonlinear optimization problems whose modeling and solution is often nontrivial. Furthermore, with the increased computational power and development of advanced analysis (e. g. , process simulators, finite element packages) and modeling systems (e. g. , GAMS, AMPL, SPEEDUP, ASCEND, gPROMS), the size and complexity of engineering optimization models is rapidly increasing. While the application of efficient local solvers (nonlinear programming algorithms) has become widespread, a major limitation is that there is often no guarantee that the solutions that are generated correspond to global optima. In some cases finding a local solution might be adequate, but in others it might mean incurring a significant cost penalty, or even worse, getting an incorrect solution to a physical problem. Thus, the need for finding global optima in engineering is a very real one. It is the purpose of this monograph to present recent developments of techniques and applications of deterministic approaches to global optimization in engineering. The present monograph is heavily represented by chemical engineers; and to a large extent this is no accident. The reason is that mathematical programming is an active and vibrant area of research in chemical engineering. This trend has existed for about 15 years.

Principles and Case Studies of Simultaneous Design - William L. Luyben 2012-02-08

There are many comprehensive design books, but none of them provide a significant number of detailed economic design examples of typically complex industrial processes. Most of the current design books cover a wide variety of topics associated with process design. In addition to discussing flowsheet development and equipment design, these textbooks go into a lot of detail on engineering economics and other many peripheral subjects such as written and oral skills, ethics, "green" engineering and product design. This book presents general process design principles in a concise readable form that can be easily comprehended by students and engineers when developing effective flow sheet and control structures. Ten detailed case studies presented illustrate an in-depth and quantitative way the application of these general principles. Detailed economic steady-state designs are developed that satisfy economic criterion such as minimize total annual cost of both capital and energy or return on incremental capital investment. Complete detailed flow sheets and Aspen Plus files are provided. Then conventional PI control structures are developed and tested for their ability to maintain product quality during disturbances. Complete Aspen Dynamics files are provided of the dynamic simulations.

Encyclopedia of Chemical Processing and Design - John J. McKetta Jr 1980-01-01

"Written by engineers for engineers (with over 150 International Editorial Advisory Board members), this highly lauded resource provides up-to-the-minute information on the chemical processes, methods, practices, products, and standards in the chemical, and related, industries. "

The Scientific Basis of Flocculation - K.J. Ives 2012-12-06

K.J. Ives Professor of Public Health Engineering University College London The aggregation of small particles in liquids, to form flocs which are large enough to settle, or to be filtered, is a common operation in industrial processes, and water and wastewater treatment. This aggregation, given the general title flocculation in this book, may be brought about by the addition of chemicals to reduce the stability of the original suspension, by neutralising electrical forces of repulsion, by the addition of chemicals (polymers) to link particles by bridging action, by the addition of chemicals which form particles to increase collision probabilities, and by the input of energy leading to hydrodynamically induced collisions. The particles undergoing flocculation may range from colloidal in the nanometer size range, through microscopic (micron) size, up to visible particles in the millimeter size range; that is a total size range of six orders of magnitude. Consequently the colloid chemist and the hydrodynamicist are both concerned with the interactions that take place, and to them the engineer must turn, to obtain the fundamental information necessary for the process design and its associated hardware.

Annual Reports on Fermentation Processes - D. Perlman 2014-12-01

Annual Reports on Fermentation Processes, Volume 1 furnishes a critical account of significant developments concerning fermentation processes. This book discusses the mutation, selection, and optimization of mutagenesis; fermentation substrates; and published accounts of computer-coupled fermentation systems. The waste materials as SCP substrates, immobilized cell processes, and microbial transformations of organic compounds are also elaborated. This publication likewise covers

the microbiological and enzymatic conversion of β -lactam antibiotics, microbiological production of chemical feedstocks, and aeration systems and their performance. Other topics include the toxicology and regulation of enzyme use, general considerations of immobilized enzyme systems, mutational biosynthesis, and biotransformations and the role of precursors. This volume is a good reference for students and researchers interested in fermentation research and developments.

Process Industry Economics - David Brennan 2020-05-18

Process Industry Economics: Principles, Concepts and Applications, Second Edition, explores the fundamentals of market evaluation, capital and operating cost estimation, and profitability evaluation, along with their implications for process technology evaluation, project development and investment decisions. Sections cover time dependent technology evolution in process plants, including scale development, performance improvement in new and operating plants, and learning related to environmental, safety and sustainability assessments. Influences on capital investment decisions, including capacity planning and environmental considerations are explored and supported by case studies. Finally, the aspects of overall industry performance and drivers are discussed. Outlines the basic principles of economic evaluation Identifies the roles of engineering, scientific, commercial and management personnel in contributing to economic evaluation Explores the interaction of economics with safety, environmental and sustainability criteria in project evaluation

Chemical Process Engineering - Harry Silla 2003-08-08

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.

Sustainable Process Engineering - David Brennan 2012-10-01

This book introduces chemical engineering students to key concepts, strategies, and evaluation methods in sustainable process engineering. The book is intended to supplement chemical engineering texts in fundamentals and design, rather than replace them. The key objectives of the book are to widen system boundaries beyond a process plant to include utility supplies, interconnected plants, wider industry sectors, and entire product life cycles; identify waste and its sources in process and utility systems and adopt waste minimization strategies; broaden evaluation to include technical, economic, safety, environmental, social, and sustainability criteria and to integrate the assessments; and broaden the engineering horizon to incorporate planning, development, design, and operations. Case examples are integrated with chapter topics throughout, and defined problems that reflect current industry challenges are provided. Contexts include electricity generation, waste sulfuric acid minimization, petroleum fuel desulfurization, and byproduct hydrogen utilization.

Chemical Process Structures and Information Flows - Richard S.H. Mah 2013-10-22

Chemical Process Structures and Information Flows focuses on the role of computers in the understanding of chemical processes, including the use of simulation and optimization in computational problems. The book first underscores graphs and digraphs and pipeline networks.

Discussions focus on cutsets and connectivity, directed graphs, trees and circuits, matrix representation of digraphs and graphs, reachability matrix, alternative problem formulations and specifications, and steady state conditions in cyclic networks. The manuscript also ponders on computation sequence in process flowsheet calculations and sparse matrix computation. The publication examines scheduling and design of batch plants, including scheduling of products and operations, characteristics of batch processes, branch and bound methods, and multipurpose batch plants. The text also elaborates on observability and redundancy and process data reconciliation and rectification. The manuscript is a valuable reference for chemical engineering students and readers interested in chemical processes and information flow.

Computational Methods for Process Simulation - W. Fred Ramirez 1997-11-20

Process Modelling and simulation have proved to be extremely successful engineering tools for the design and optimisation of physical, chemical and biochemical processes. The use of simulation has expanded rapidly over the last two decades because of the availability of large high-speed computers and indeed has become even more widespread with the rise of the desk-top PC resources now available to nearly every engineer and

student. In the chemical industry large, realistic non-linear problems are routinely solved with the aid of computer simulation. This has a number of benefits, including easy assessment of the economic desirability of a project, convenient investigation of the effects of changes to system variables, and finally the introduction of mathematical rigour into the design process and inherent assumptions that may not have been there before. Computational Methods for Process Simulation develops the methods needed for the simulation of real processes to be found in the process industries. It also stresses the engineering fundamentals used in developing process models. Steady state and dynamic systems are considered, for both spatially lumped and spatially distributed problems. It develops analytical and numerical computational techniques for algebraic, ordinary and partial differential equations, and makes use of computer software routines that are widely available. Dedicated software examples are available via the internet. Written for a compulsory course element in the US Includes examples using software used in academia and industry Software available via the Internet

Catalog of Copyright Entries. Third Series - Library of Congress.

Copyright Office 1969

Chemical Process Equipment - James R. Couper 2012-09-19

First published: Chemical process equipment / Stanley M. Walas. 1988.

Chemical Engineering Design - Ray Sinnott 2005-07-01

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

Advances in Chemical Engineering - 1970-05-31

Advances in Chemical Engineering

European Symposium on Computer Aided Process Engineering - 13 -

Andrzej Kraslawski 2003-05-07

This book contains papers presented at the 13th European Symposium on Computer Aided Process Engineering (ESCAPE-13). The ESCAPE symposia bring together scientists, students and engineers from academia and industry, who are active in the research and application of Computer Aided Process Engineering. The objective of ESCAPE-13 is to promote CAPE applications into new businesses and technologies by highlighting the use of computers and information technology tools in five specific areas: process design; process control and dynamics; modeling, simulation and optimization; applications in pulp and paper industry; and applications in biotechnology. Includes 190 papers selected from 391 submitted abstracts. All papers have been reviewed by 33 members of the international scientific community.

Strategy of Process Engineering - Dale F. Rudd 1968

Sustainability in the Design, Synthesis and Analysis of Chemical Engineering Processes - Gerardo Ruiz Mercado 2016-07-29

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 retrofitting costs by planning for sustainability concerns at the start of the design process Link sustainability to the chemical engineering fundamentals

Chemical Process Equipment - Selection and Design (Revised 2nd Edition) - James R. Couper 2009-08-11

A facility is only as efficient and profitable as the equipment that is in it: this highly influential book is a powerful resource for chemical, process, or plant engineers who need to select, design or configure plant successfully and profitably. It includes updated information on design methods for all standard equipment, with an emphasis on real-world process design and performance. The comprehensive and influential guide to the selection and design of a wide range of chemical process equipment, used by engineers globally • Copious examples of successful applications, with supporting schematics and data to illustrate the functioning and performance of equipment Revised edition, new material includes updated equipment cost data, liquid-solid and solid systems, and the latest information on membrane separation technology Provides equipment rating forms and manufacturers' data, worked examples, valuable shortcut methods, rules of thumb, and equipment rating forms to demonstrate and support the design process Heavily illustrated with many line drawings and schematics to aid understanding, graphs and tables to illustrate performance data

Final Report, Technical and Economic Assessment of Methods for Direct Conversion of Agricultural Residue to Usable Energy - R. C. Bailie 1976

Product and Process Design - Jan Harmsen 2018-05-22

Product and Process Design: Driving Innovation is a comprehensive textbook for students and industrial professionals. It treats the combined design of innovative products and their innovative manufacturing processes, providing specific methods for BSc, MSc, PDEng and PhD courses. Students, industrial innovators and managers are guided through all design steps in all innovation stages (discovery, concept, feasibility, development, detailed engineering, and implementation) to successfully obtain novel products and their novel processes. The authors' decades of innovation experience in industry, as well as in teaching BSc, MSc, and post-academic product and process design courses, thereby including the latest design publications, culminate in this book.

Natural and Artificial Photosynthesis - Reza Razeghifard 2013-08-23

This technical book explores current and future applications of solar power as an unlimited source of energy that earth receives every day. Photosynthetic organisms have learned to utilize this abundant source of energy by converting it into high-energy biochemical compounds. Inspired by the efficient conversion of solar energy into an electron flow, attempts have been made to construct artificial photosynthetic systems capable of establishing a charge separation state for generating electricity or driving chemical reactions. Another important aspect of photosynthesis is the CO₂ fixation and the production of high energy compounds. Photosynthesis can produce biomass using solar energy while reducing the CO₂ level in air. Biomass can be converted into biofuels such as biodiesel and bioethanol. Under certain conditions,

photosynthetic organisms can also produce hydrogen gas which is one of the cleanest sources of energy.

Fourth European Symposium on Computer Aided Process Engineering, ESCAPE 4 - F. A. Perris 1994

The ESCAPE symposia address the applications of computer aids to all aspects of process engineering. The primary objective is the interchange of information on industrial needs, new technology developments and research opportunities. With industrialists and academia contributing from all over the world, this set of proceedings provides an overview of current international computer-aided process engineering (CAPE). This book is intended for chemical and process engineers, design engineers and computer-aided specialists.

One Hundred Years of Chemical Engineering - Nicholas A. Peppas 2012-12-06

One hundred years ago, in September 1888, Professor Lewis Mills Norton (1855-1893) of the Chemistry Department of the Massachusetts Institute of Technology introduced to the curriculum a course on industrial chemical practice. This was the first structured course in chemical engineering taught in a University. Ten years later, Norton's successor Frank H. Thorpe published the first textbook in chemical engineering, entitled "Outlines of Industrial Chemistry." Over the years, chemical engineering developed from a simple industrial chemical analysis of processes into a mature field. The volume presented here includes most of the commissioned and contributed papers presented at the American Chemical Society Symposium celebrating the centenary of chemical engineering. The contributions are presented in a logical way, starting first with the history of chemical engineering, followed by analyses of various fields of chemical engineering and concluding with the history of various U.S. and European Departments of Chemical Engineering. I wish to thank the authors of the contributions/chapters of this volume for their enthusiastic response to my idea of publishing this volume and Dr. Gianni Astarita of the University of Naples, Italy, for his encouragement during the initial stages of this project.

Cost Engineering Management Techniques - Black 1984-05-11

Commemorative Issue to Celebrate the Life and Work of Prof. Roger W.H. Sargent - Rafiqul Gani 2020-12-29

This book celebrates the life, work and influence of Professor Roger W.H. Sargent of Imperial College London. It does so through a range of original contributions that span the wide academic and industry interests of Professor Sargent. Roger Sargent passed away in late 2018, but his legacy lives on through his enormous academic tree, which traces to the early 1960s. That huge body of work has also had significant impacts on industrial practices. Roger was regarded as "the father of Process Systems Engineering (PSE)". This area of Chemical Engineering continues to influence the modelling, design, control, optimization and integrated performance of industrial and related processes. This book highlights some of those impacts and the ongoing importance of PSE in helping to solve some of the grand challenges of our time.