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A Dictionary of*

Chemical Engineering is one of the latest additions to the market leading Oxford Paperback Reference series. In over 3,400 concise and authoritative A to Z entries, it provides definitions and explanations for chemical engineering terms in areas including: materials, energy balances, reactions, separations, sustainability, safety, and ethics. Naturally, the dictionary also covers many pertinent terms from the fields of chemistry, physics, biology, and mathematics. Useful entry-level web links are listed and regularly updated on a dedicated companion website to expand the coverage of the dictionary. Comprehensively

cross-referenced and complemented by over 60 line drawings, this excellent new volume is the most authoritative dictionary of its kind. It is an essential reference source for students of chemical engineering, for professionals in this field (as well as related disciplines such as applied chemistry, chemical technology, and process engineering), and for anyone with an interest in the subject.

**Encyclopedia of Chemical Processing and Design** Springer Science & Business Media

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.

*A Dictionary of Chemical Engineering*  
CRC Press

First published in 1998, this book introduces a new concept of profitability, called the 'efficiency rate of profit', which is defined as the ratio between the unit net margin and the unit capital requirement and shows how the efficiency rate of profit may be used in the assessment of mechanization and economies of scale.

The book also shows how the efficiency rate of profit relates to the financial opportunity cost of investment, thus resolving the long-standing controversy over 'interest as a

cost'. Using real-world plant-level data, the book explains fully the process of mechanization, how increasing returns to scale works at the plant level through power rule relating plant or equipment cost to capacity and how and why it is more cost effective to combine mechanization with expanding the scale of production in one combined 'package' of efficiency improvement.

Petroleum Refining Design and Applications Handbook, Volume 5 OUP Oxford

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.

Sweet's Unit Cost Guide 2002 Springer Science & Business Media

MARK FINKELSTEIN  
National Renewable Energy Laboratory  
BRIAN H. DAVISON  
Oak Ridge National Laboratory  
The proceedings of the 19th symposium on Biotechnology for Fuels and Chemicals, held in Colorado Springs, Colorado, May 4-8, 1997, had over 200 attendees. This meeting continues to provide a unique forum for the presentation of new applications and recent research advances in the production of fuels and

chemicals through biotechnology. The utilization of renewable resources, and in particular cellulosic biomass, has broad implications in today's world of green house gases, global warming, ozone layers, climate change, energy sustainability, and carbon emissions. It also has relevance to the chemical industry's continuing need to both lower current chemical production costs and produce novel chemicals. Biotechnology and bioprocessing are now making it possible to convert this biomass to fuels and chemicals in a commercially attractive fashion. The 19th Symposium captures a wide range of technical topics from an academic, industrial, or

government perspective. A variety of biomass feedstocks are discussed in Session 1, along with several updated and innovative pretreatment processing approaches. The ability to turn lignocellulosic materials into simple sugars offers great opportunities to generate cost-effective feed stocks to be used in biotechnological processes for the production of fuels and chemicals. Through the advent of genetic engineering, the development of a series of exciting new biocatalysts and microbes were presented in Session 2. *Chemical Engineering Design* Routledge  
 PETROLEUM REFINING  
 With no new refineries having been built in

decades, companies continue to build onto or reverse engineer and re-tool existing refineries. With so many changes in the last few years alone, books like this are very much in need. There is truly a renaissance for chemical and process engineering going on right now across multiple industries. This fifth and final volume in the "Petroleum Refining Design and Applications Handbook" set, this book continues the most up-to-date and comprehensive coverage of the most significant and recent changes to petroleum refining, presenting the state-of-the-art to the engineer, scientist, or student. Besides the list below, this groundbreaking new

volume describes blending of products from the refinery, applying the ternary diagrams and classifications of crude oils, flash point blending, pour point blending, aniline point blending, smoke point and viscosity blending, cetane and diesel indices. The volume further reviews refinery operational cost, cost allocation of actual usage, project and economic evaluation involving cost estimation, cash flow involving return on investment, net present values, discounted cash flow rate of return, net present values, payback period, inflation and sensitivity analysis, and so on. It reviews global effects on the refining economy, carbon tax,

carbon foot print, global warming potential, carbon dioxide equivalent, carbon credit, carbon offset, carbon price, and so on. It reviews sustainability in petroleum refining and alternative fuels (biofuels and so on), impact of the overall greenhouse effects, carbon capture and storage in refineries, process intensification in biodiesel, biofuel from green diesel, acid-gas removal and emerging technologies, carbon capture and storage, gas heated reformer unit, pressure swing adsorption process, steam methane reforming for fuel cells, grey, blue and green hydrogen production, new technologies for carbon capture and storage, carbon clean process

design, refinery of the future, refining and petrochemical industry characteristics. The text is packed with Excel spreadsheet calculations and Honeywell UniSim Design software in some examples, and it includes an invaluable glossary of petroleum and petrochemical technical terminologies. Useful as a textbook, this is also an excellent, handy go-to reference for the veteran engineer, a volume no chemical or process engineering library should be without. Written by one of the world's foremost authorities, this book sets the standard for the industry and is an integral part of the petroleum refining renaissance. It is truly a must-have for any



practicing engineer or student in this area.

**Basic Cost Engineering** CRC Press

This book covers the advantages, limitations and operational standards for common land application of biosolids practices, including uses on agricultural lands, forest lands, reclamation sites, and public and private use sites. It is useful to people in all aspects of the wastewater industry.

*Life Cycle Costing* CRC Press

The demand for functional foods and nutraceuticals is on the rise, leaving product development companies racing to improve bioactive compound extraction methods - a key component of

functional foods and nutraceuticals development. From established processes such as steam distillation to emerging techniques like supercritical fluid technology, Ext Food Plant Economics John Wiley & Sons This complete revision of Applied Process Design for Chemical and Petrochemical Plants, Volume 1 builds upon Ernest E. Ludwig's classic text to further enhance its use as a chemical engineering process design manual of methods and proven fundamentals. This new edition includes important supplemental mechanical and related data, nomographs and charts. Also included within are improved techniques and

fundamental methodologies, to guide the engineer in designing process equipment and applying chemical processes to properly detailed equipment. All three volumes of Applied Process Design for Chemical and Petrochemical Plants serve the practicing engineer by providing organized design procedures, details on the equipment suitable for application selection, and charts in readily usable form. Process engineers, designers, and operators will find more chemical petrochemical plant design data in: Volume 2, Third Edition, which covers distillation and packed towers as well as material on azeotropes and ideal/non-ideal

systems. Volume 3, Third Edition, which covers heat transfer, refrigeration systems, compression surge drums, and mechanical drivers. A. Kayode Coker, is Chairman of Chemical & Process Engineering Technology department at Jubail Industrial College in Saudi Arabia. He's both a chartered scientist and a chartered chemical engineer for more than 15 years. and an author of Fortran Programs for Chemical Process Design, Analysis and Simulation, Gulf Publishing Co., and Modeling of Chemical Kinetics and Reactor Design, Butterworth-Heinemann. Provides improved design manuals for methods and proven fundamentals of

process design with related data and charts Covers a complete range of basic day-to-day petrochemical operation topics with new material on significant industry changes since 1995. *Profitability, Mechanization and Economies of Scale* John Wiley & Sons In these pages is all the information that you-manager, engineer, or other technical professional-would need to select, size, and estimate "budget/study" level capital and annual costs for a variety of air pollution control equipment. This equipment includes wet scrubbers, carbon adsorbers, and other "add-on" devices. This book also deals with such nonstack controls as wet dust

suppression systems and flue gas desulfurization systems. The costs are current (1988 or 1989 dollars) and are mainly presented in equational form for ease of computerization and updating. Clear, comprehensive equipment sizing procedures are also detailed. Finally, several detailed example problems are included to illustrate the sizing and costing procedures. This book is not just for technical personnel, however. The material is easy to grasp and use. Anyone with an air pollution control background can follow and apply the procedures and data herein. Using this book, air pollution control professionals can now develop sound,

defensible (within  $\pm 30\%$ ) cost estimates with a minimum of time and effort.

*Dodge metric unit cost*  
 Psychology Press

By far the most commonly encountered and energy-intensive unit operation in almost all industrial sectors, industrial drying continues to attract the interest of scientists, researchers, and engineers. The Handbook of Industrial Drying, Fourth Edition not only delivers a comprehensive treatment of the current state of the art, but also serves as a Chemical Engineering Economics CRC Press

A text to the advances and development of novel technologies in the production of high-value products from economically viable

raw materials  
 Lignocellulosic  
 Biorefining  
 Technologies is an essential guide to the most recent advances and developments of novel technologies in the production of various high-value products from economically viable raw materials. Written by a team of experts on the topic, the book covers important topics specifically on production of economical and sustainable products such as various biofuels, organic acids, enzymes, biopigments, biosurfactants, etc. The book highlights the important aspects of lignocellulosic biorefining including structure, function, and chemical composition of the plant cell wall and reviews the details

about the various components present in the lignocellulosic biomass and their characterizations. The authors explore the various approaches available for processing lignocellulosic biomass into second generation sugars and focus on the possibilities of utilization of lignocellulosic feedstocks for the production of biofuels and biochemicals. Each chapter includes a range of clear, informative tables and figures, and contains relevant references of published articles. This important text: Provides cutting-edge information on the recent developments in lignocellulose biorefinery Reviews production of various economically important

and sustainable products, such as biofuels, organic acids, biopigments, and biosurfactants Highlights several broad-ranging areas of recent advances in the utilization of a variety of lignocellulosic feedstocks Provides a valuable, authoritative reference for anyone interested in the topic Written for post-graduate students and researchers in disciplines such as biotechnology, bioengineering, forestry, agriculture, and chemical industry, Lignocellulosic Biorefining Technologies is an authoritative and updated guide to the knowledge about various biorefining technologies. [Air Pollution Control Technology Handbook](#)

Elsevier

This reference covers both conventional and advanced methods for automatically controlling dynamic industrial processes.

Land Application of Biosolids Elsevier

This work focuses on the application of fundamental cost engineering principles to the capital and operating costs estimation of major projects. It provides detailed coverage of profitability, risk, and sensitivity analysis.

This third edition: discusses novel strategies for calculating preliminary estimates using MasterFormat;

presents new informa

**Food Process Design**

Electrochem

Technologies &

Materials Inc.

This book insures the

legacy of the original 1950 classic, Process Heat Transfer, by Donald Q. Kern. This second edition book is divided into three parts: Fundamental Principles; Heat Exchangers; and Other Heat Transfer Equipment/

Considerations. - Part I provides a series of chapters concerned with introductory topics that are required when solving heat transfer problems. This part of the book deals with topics such as steady-state heat conduction, unsteady-state conduction, forced convection, free convection, and radiation. - Part II is considered by the authors to be the "meat" of the book - addressing heat transfer equipment design procedures and

applications. In addition to providing a more meaningful treatment of the various types of heat exchangers, this part also examines the impact of entropy calculations on exchanger design. - Part III of the book examines other related topics of interest, including boiling and condensation, refrigeration and cryogenics, boilers, cooling towers and quenchers, batch and unsteady-state processes, health & safety and the accompanying topic of risk. An Appendix is also included. What is new in the 2nd edition Changes that are addressed in the 2nd edition so that Kern's original work continues to remain relevant in 21st century process

engineering include: - Updated Heat Exchanger Design - Increased Number of Illustrative Examples - Energy Conservation/ Entropy Considerations - Environmental Considerations - Health & Safety - Risk Assessment - Refrigeration and Cryogenics - Inclusion of SI Units Biotechnology for Fuels and Chemicals Routledge A detailed reference for the practicing engineer, Air Pollution Control Technology Handbook, Second Edition focuses on air pollution control systems and outlines the basic process engineering and cost estimation required for its design. Written by seasoned experts in the field, this book offers a fundamental

understanding of the factors resulting in *Estimating Costs of Air Pollution Control* CRC Press

Making the specifics of a complex concern accessible and its handling quite manageable, this fourth edition of the *Project and Cost Engineers' Handbook* examines the variables associated with international projects and project risk analysis. It provides instruction on contingency planning, delves into ethical considerations, considers the impact of *Project and Cost Engineers' Handbook, Third Edition*, Elsevier. At least, the author wishes to thank his constantly helpful wife Maggie and his secretary Pat Weimer; the former for her

patience, encouragement, and for acting as a sounding-board, and the latter who toiled endlessly, cheerfully, and most competently on the book's preparation.

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Engineering, Licensing  
/ 40 Working Capital /  
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and economically  
feasible. A sharply  
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and Economic Design  
for Process Engineers  
provides the tools and  
methods to resolve  
design and economic  
issues. It helps you  
integrate technical and  
economic decision  
making, creating more  
profit and growth for  
your organization. The  
book puts methods  
that are simple, fast,

and inexpensive within easy reach. Author Thane Brown sets the stage by explaining the engineer's role in the creation of economically feasible projects. He discusses the basic economics of projects — how they are funded, what kinds of investments they require, how revenues, expenses, profits, and risks are interrelated, and how cash flows into and out of a company. In the engineering economics section of the book, Brown covers topics such as present and future values, annuities, interest rates, inflation, and inflation indices. He details how to create order-of-magnitude and study grade estimates for the investments in a project and how to

make study grade production cost estimates. Against this backdrop, Brown explores a unique scheme for producing an Economic Design. He demonstrates how using the Economic Design Model brings increased economic thinking and rigor into the early parts of design, the time in a project's life when its cost structure is being set and when the engineer's impact on profit is greatest. The model emphasizes three powerful new tools that help you create a comprehensive design option list. When the model is used early in a project, it can drastically lower both capital and production costs. The book's uniquely industrial focus presents topics

as they would happen in a real work situation. It shows you how to combine technical and economic decision making to create economically optimum designs and increase your impact on profit and growth, and, therefore, your importance to your organization. Using these time-tested techniques, you can design processes that cost less to build and operate, and improve your company's profit.

Process Engineering and Plant Design  
DIANE Publishing  
Energy Systems Engineering is one of the most exciting and fastest growing fields in engineering. Modeling and simulation plays a key role in Energy Systems Engineering because it is the primary basis on

which energy system design, control, optimization, and analysis are based. This book contains a specially curated collection of recent research articles on the modeling and simulation of energy systems written by top experts around the world from universities and research labs, such as Massachusetts Institute of Technology, Yale University, Norwegian University of Science and Technology, National Energy Technology Laboratory of the US Department of Energy, University of Technology Sydney, McMaster University, Queens University, Purdue University, the University of Connecticut, Technical University of Denmark, the University of

Toronto, Technische Universität Berlin, Texas A&M, the University of Pennsylvania, and many more. The key research themes covered include energy systems design, control systems, flexible operations, operational strategies, and systems analysis. The addressed areas of application include electric power

generation, refrigeration cycles, natural gas liquefaction, shale gas treatment, concentrated solar power, waste-to-energy systems, micro-gas turbines, carbon dioxide capture systems, energy storage, petroleum refinery unit operations, Brayton cycles, to name but a few.