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Chemical Engineering An Introduction *Cambridge University Press* 'Chemical engineering is the field of applied science that employs physical, chemical, and biological rate processes for the betterment of humanity'. This opening sentence of Chapter 1 has been the underlying paradigm of chemical engineering. **Chemical Engineering: An Introduction** is designed to enable the student to explore the activities in which a modern chemical engineer is involved by focusing on mass and energy balances in liquid-phase processes. Problems explored include the design of a feedback level controller, membrane separation, hemodialysis, optimal design of a process with chemical reaction and separation, washout in a bioreactor, kinetic and mass transfer limits in a two-phase reactor, and the use of the membrane reactor to overcome equilibrium limits on conversion. Mathematics is employed as a language at the most elementary level. Professor Morton M. Denn incorporates design meaningfully; the design and analysis problems are realistic in format and scope. **Basic Principles and Calculations in Chemical Engineering** *FT Press* Best-selling introductory chemical

engineering book - now updated with far more coverage of biotech, nanotech, and green engineering • •Thoroughly covers material balances, gases, liquids, and energy balances. •Contains new biotech and bioengineering problems throughout. •Adds new examples and homework on nanotechnology, environmental engineering, and green engineering. •All-new student projects chapter. •Self-assessment tests, discussion problems, homework, and glossaries in each chapter. **Basic Principles and Calculations in Chemical Engineering, 8/e**, provides a complete, practical, and student-friendly introduction to the principles and techniques of modern chemical, petroleum, and environmental engineering. The authors introduce efficient and consistent methods for solving problems, analyzing data, and conceptually understanding a wide variety of processes. This edition has been revised to reflect growing interest in the life sciences, adding biotechnology and bioengineering problems and examples throughout. It also adds many new examples and homework assignments on nanotechnology, environmental, and green engineering, plus many updates to existing examples. A new chapter presents multiple student projects, and several chapters from the previous edition have been condensed for greater focus. This text's features include: • •Thorough introductory coverage, including unit conversions, basis selection, and process measurements. •Short chapters supporting flexible, modular learning. •Consistent, sound strategies for solving material and energy balance problems. •Key concepts ranging from stoichiometry to enthalpy. •Behavior of gases, liquids, and solids. •Many tables, charts, and reference appendices. •Self-assessment tests, thought/discussion problems, homework problems, and glossaries in each chapter. **Numerical Analysis for Engineers and Scientists** *Cambridge University Press* Graduate-level introduction balancing theory and application. Provides full coverage of classical methods with many practical examples and demonstration programs. **Introduction to Chemical Engineering** *PHI Learning Pvt. Ltd.* This book is an outgrowth of the author's teaching experience of a course on Introduction to Chemical Engineering to the first-year chemical engineering students of the Indian Institute of Technology Madras. The book serves to introduce the students to the role of a chemical engineer in society. In addition to the classical industries, the role of chemical engineers in several esoteric areas such as semiconductor processing and biomedical engineering is discussed. Besides highlighting the principles and processes of chemical engineering, the book shows how chemical engineering concepts from the basic sciences and economics are used to seek solutions to engineering problems. The book is rich in examples of innovative solutions found to problems faced in chemical industry. It includes a wide spectrum of topics, selected from the industrial interactions of the author. It encourages the student to see the similarities in the concepts which govern apparently dissimilar examples. It introduces various concepts, using both physical and mathematical bases, to facilitate the understanding of difficult processes such as the scale-up process. The book contains several case studies

on safety, ethics and environmental issues in chemical process industries. **Introduction to Chemical Engineering Analysis** *John Wiley & Sons* **Process Dynamics and Control** *John Wiley & Sons* This 3rd edition provides chemical engineers with process control techniques that are used in practice while offering detailed mathematical analysis. Numerous examples and simulations are used to illustrate key theoretical concepts. New exercises are integrated throughout several chapters to reinforce concepts. **Introduction to Chemical Engineering: Tools for Today and Tomorrow, 5th Edition** *Wiley Global Education* This concise book is a broad and highly motivational introduction for first-year engineering students to the exciting 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. **Modern Control System Theory** *New Age International* About the book... The book provides an integrated treatment of continuous-time and discrete-time systems for two courses at postgraduate level, or one course at undergraduate and one course at postgraduate level. It covers mainly two areas of modern control theory, namely; system theory, and multivariable and optimal control. The coverage of the former is quite exhaustive while that of latter is adequate with significant provision of the necessary topics that enables a research student to comprehend various technical papers. The stress is on interdisciplinary nature of the subject. Practical control problems from various engineering disciplines have been drawn to illustrate the potential concepts. Most of the theoretical results have been presented in a manner suitable for digital computer programming along with the necessary algorithms for numerical computations. **Introduction to Quantum Mechanics with Applications to Chemistry** *Courier Corporation* Classic undergraduate text explores wave functions for the hydrogen atom, perturbation theory, the Pauli exclusion principle, and the structure of simple and complex molecules. Numerous tables and figures. **Introduction to Chemical Engineering Analysis Using Mathematica for Chemists, Biotechnologists and Materials Scientists** *Academic Press* **Introduction to Chemical Engineering Analysis Using Mathematica, Second Edition** reviews the processes and designs used to manufacture, use, and dispose of chemical products using Mathematica, one of the most powerful mathematical software tools available for symbolic, numerical, and graphical computing. Analysis and computation are explained simultaneously. The book covers the core concepts of chemical engineering, ranging from the conservation of mass and energy to chemical kinetics. The text also shows how to use the latest version of Mathematica, from the basics of writing a few lines of code through developing entire analysis programs. This second

edition has been fully revised and updated, and includes analyses of the conservation of energy, whereas the first edition focused on the conservation of mass and ordinary differential equations. Offers a fully revised and updated new edition, extended with conservation of energy Covers a large number of topics in chemical engineering analysis, particularly for applications to reaction systems Includes many detailed examples Contains updated and new worked problems at the end of the book Written by a prominent scientist in the field Polymer Melt Processing Foundations in Fluid Mechanics and Heat Transfer *Cambridge University Press* Most of the shaping in the manufacture of polymeric objects is carried out in the melt state, as it is a substantial part of the physical property development. Melt processing involves an interplay between fluid mechanics and heat transfer in rheologically complex liquids, and taken as a whole it is a nice example of the importance of coupled transport processes. This book is on the underlying foundations of polymer melt processing, which can be derived from relatively straightforward ideas in fluid mechanics and heat transfer; the level is that of an advanced undergraduate or beginning graduate course, and the material can serve as the text for a course in polymer processing or for a second course in transport processes. Wörterbuch GeoTechnik Dictionary Geotechnical Engineering Band II / *Springer-Verlag* Die beiden Bände des Wörterbuchs GeoTechnik enthalten zusammen etwa 140.000 Eintragungen. Zu jedem Stichwort werden gebräuchliche Synonyme aufgeführt. Zum besseren Verständnis finden sich unter einigen Stichwörtern zusätzliche Erläuterungen. Neben Begriffen aus der allgemeinen Geologie deckt das Wörterbuch insbesondere die eher anwendungsorientierten Themenbereiche der Geowissenschaften ab. Schwerpunktmäßig werden folgende Gebiete behandelt: - Bergbau, - Bodenkunde, - Erdbau, - Erkundungsgeologie, - Geophysik, - Geomorphologie, - Grundbau, - Hydrogeologie, - Hydrotechnik, - Ingenieurgeologie, - Kartographie, - Lagerstättenkunde, - Mineralogie, - Ozeanographie, - Vermessungswesen. Dynamics, Control, and Optimization of Free-radical Solution and Emulsion Polymerization Processes Introduction to Topology Second Edition *Courier Corporation* This text explains nontrivial applications of metric space topology to analysis. Covers metric space, point-set topology, and algebraic topology. Includes exercises, selected answers, and 51 illustrations. 1983 edition. Introduction to Statistical Inference *Courier Corporation* This excellent text emphasizes the inferential and decision-making aspects of statistics. The first chapter is mainly concerned with the elements of the calculus of probability. Additional chapters cover the general properties of distributions, testing hypotheses, and more. An Introduction to Information Theory *Courier Corporation* Graduate-level study for engineering students presents elements of modern probability theory, elements of information theory with emphasis on its basic roots in probability theory and elements of coding theory. Emphasis is on such basic concepts as sets, sample space, random variables, information measure, and capacity. Many reference tables and extensive bibliography. 1961 edition. An Introduction to Mathematical

Taxonomy *Courier Corporation* For students of mathematical biology, an introduction to taxonomic characters, measurement of similarity, analysis of principal components, multidimensional scaling, cluster analysis, identification and assignment techniques, and the construction of evolutionary trees. **Introduction to the Calculus of Variations** *Courier Corporation* Provides a thorough understanding of calculus of variations and prepares readers for the study of modern optimal control theory. Selected variational problems and over 400 exercises. Bibliography. 1969 edition. **Introduction to the Theory of Relativity** *Courier Corporation* Comprehensive coverage of special theory (frames of reference, Lorentz transformation, more), general theory (principle of equivalence, more) and unified theory (Weyl's gauge-invariant geometry, more.) Foreword by Albert Einstein. **Introduction to Partial Differential Equations and Hilbert Space Methods** *Courier Corporation* Easy-to-use text examines principal method of solving partial differential equations, 1st-order systems, computation methods, and much more. Over 600 exercises, with answers for many. Ideal for a 1-semester or full-year course. **Introduction to Electromagnetic Theory** *Courier Corporation* Direct, stimulating approach covers electrostatics of point charges, distributions of charge, conductors and dielectrics, currents and circuits, Lorentz force and magnetic field, magnetic field of steady currents, magnetic media, Maxwell equations, more. For advanced undergraduate and graduate students. 228 illustrations by the author. 1963 edition. **Molecular Modeling and Theory in Chemical Engineering** *Elsevier* In recent years chemical engineers have become increasingly involved in the design and synthesis of new materials and products as well as the development of biological processes and biomaterials. Such applications often demand that product properties be controlled with precision. Molecular modeling, simulating chemical and molecular structures or processes by computer, aids scientists in this endeavor. **Volume 28 of Advances in Chemical Engineering** presents discussions of theoretical and computational methods as well as their applications to specific technologies. **Chemical Solution Deposition of Functional Oxide Thin Films** *Springer Science & Business Media* This is the first text to cover all aspects of solution processed functional oxide thin-films. **Chemical Solution Deposition (CSD)** comprises all solution based thin-film deposition techniques, which involve chemical reactions of precursors during the formation of the oxide films, i. e. sol-gel type routes, metallo-organic decomposition routes, hybrid routes, etc. While the development of sol-gel type processes for optical coatings on glass by silicon dioxide and titanium dioxide dates from the mid-20th century, the first CSD derived electronic oxide thin films, such as lead zirconate titanate, were prepared in the 1980's. Since then CSD has emerged as a highly flexible and cost-effective technique for the fabrication of a very wide variety of functional oxide thin films. Application areas include, for example, integrated dielectric capacitors, ferroelectric random access memories, pyroelectric infrared detectors, piezoelectric micro-electromechanical systems, antireflective coatings, optical filters, conducting-,

transparent conducting-, and superconducting layers, luminescent coatings, gas sensors, thin film solid-oxide fuel cells, and photoelectrocatalytic solar cells. In the appendix detailed "cooking recipes" for selected material systems are offered. **An Introduction to Statistical Thermodynamics** *Courier Corporation* "A large number of exercises of a broad range of difficulty make this book even more useful...a good addition to the literature on thermodynamics at the undergraduate level." — *Philosophical Magazine* Although written on an introductory level, this wide-ranging text provides extensive coverage of topics of current interest in equilibrium statistical mechanics. Indeed, certain traditional topics are given somewhat condensed treatment to allow room for a survey of more recent advances. The book is divided into four major sections. Part I deals with the principles of quantum statistical mechanics and includes discussions of energy levels, states and eigenfunctions, degeneracy and other topics. Part II examines systems composed of independent molecules or of other independent subsystems. Topics range from ideal monatomic gas and monatomic crystals to polyatomic gas and configuration of polymer molecules and rubber elasticity. An examination of systems of interacting molecules comprises the nine chapters in Part III, reviewing such subjects as lattice statistics, imperfect gases and dilute liquid solutions. Part IV covers quantum statistics and includes sections on Fermi-Dirac and Bose-Einstein statistics, photon gas and free-volume theories of quantum liquids. Each chapter includes problems varying in difficulty — ranging from simple numerical exercises to small-scale "research" propositions. In addition, supplementary reading lists for each chapter invite students to pursue the subject at a more advanced level. Readers are assumed to have studied thermodynamics, calculus, elementary differential equations and elementary quantum mechanics. Because of the flexibility of the chapter arrangements, this book especially lends itself to use in a one-or two-semester graduate course in chemistry, a one-semester senior or graduate course in physics or an introductory course in statistical mechanics. **Introduction to the Theory of Games** *Courier Corporation* One of the classic early monographs on game theory, this comprehensive overview of the mathematical theory of games illustrates applications to situations involving conflicts of interest, including economic, social, political, and military contexts. Appropriate for advanced undergraduate and graduate courses; advanced calculus a prerequisite. Includes 51 figures and 8 tables. 1952 edition. **AICHEMI Modular Instruction Series F, Material and Energy Balances Stability of Reaction and Transport Processes** *Prentice Hall* **Introduction to Topology** *Courier Corporation* Highly regarded for its exceptional clarity, imaginative and instructive exercises, and fine writing style, this concise book offers an ideal introduction to the fundamentals of topology. It provides a simple, thorough survey of elementary topics, starting with set theory and advancing to metric and topological spaces, connectedness, and compactness. 1975 edition. **Lattice Boltzmann Modeling for Chemical Engineering** *Academic Press* **Lattice Boltzmann Modeling for Chemical Engineering, Volume 56 in**

the Advances in Chemical Engineering series, highlights new advances in the field, with this new volume presenting interesting chapters on Simulations of homogeneous and heterogeneous chemical reactions, LBM for 3D Chemical Reactors, LBM Simulations of PEM fuel cells, LBM for separation processes, LBM for two-phase flow (bio)reactors, and more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Advances in Chemical Engineering series Includes the latest information on Lattice Boltzmann Modeling for Chemical Engineering Catalog of Copyright Entries. Third Series 1960 *Copyright Office, Library of Congress* Includes Part 1, Number 1 & 2: Books and Pamphlets, Including Serials and Contributions to Periodicals (January - December) Introduction to Probability *Courier Corporation* Featured topics include permutations and factorials, probabilities and odds, frequency interpretation, mathematical expectation, decision making, postulates of probability, rule of elimination, much more. Exercises with some solutions. Summary. 1973 edition. Introduction to Projective Geometry *Courier Corporation* This introductory volume offers strong reinforcement for its teachings, with detailed examples and numerous theorems, proofs, and exercises, plus complete answers to all odd-numbered end-of-chapter problems. 1970 edition. Introduction to Stochastic Control Theory *Courier Corporation* Exploration of stochastic control theory in terms of analysis, parametric optimization, and optimal stochastic control. Limited to linear systems with quadratic criteria; covers discrete time and continuous time systems. 1970 edition. A Geometric Introduction to Topology *Courier Corporation* First course in algebraic topology for advanced undergraduates. Homotopy theory, the duality theorem, relation of topological ideas to other branches of pure mathematics. Exercises and problems. 1972 edition. An Introduction to Orthogonal Polynomials *Courier Corporation* Concise introduction covers general elementary theory, including the representation theorem and distribution functions, continued fractions and chain sequences, the recurrence formula, special functions, and some specific systems. 1978 edition. Optimization in Chemical Engineering *Cambridge University Press* Optimization is used to determine the most appropriate value of variables under given conditions. The primary focus of using optimisation techniques is to measure the maximum or minimum value of a function depending on the circumstances. This book discusses problem formulation and problem solving with the help of algorithms such as secant method, quasi-Newton method, linear programming and dynamic programming. It also explains important chemical processes such as fluid flow systems, heat exchangers, chemical reactors and distillation systems using solved examples. The book begins by explaining the fundamental concepts followed by an elucidation of various modern techniques including trust-region methods, Levenberg-Marquardt algorithms, stochastic optimization, simulated annealing and statistical optimization. It studies the multi-objective optimization technique and its applications in chemical engineering and also discusses the theory and applications of various optimization software

tools including LINGO, MATLAB, MINITAB and GAMS. **Introduction to Partial Differential Equations with Applications** *Courier Corporation* This text explores the essentials of partial differential equations as applied to engineering and the physical sciences. Discusses ordinary differential equations, integral curves and surfaces of vector fields, the Cauchy-Kovalevsky theory, more. Problems and answers. **An Elementary Introduction to the Theory of Probability** *Courier Corporation* This compact volume equips the reader with all the facts and principles essential to a fundamental understanding of the theory of probability. It is an introduction, no more: throughout the book the authors discuss the theory of probability for situations having only a finite number of possibilities, and the mathematics employed is held to the elementary level. But within its purposely restricted range it is extremely thorough, well organized, and absolutely authoritative. It is the only English translation of the latest revised Russian edition; and it is the only current translation on the market that has been checked and approved by Gnedenko himself. After explaining in simple terms the meaning of the concept of probability and the means by which an event is declared to be in practice, impossible, the authors take up the processes involved in the calculation of probabilities. They survey the rules for addition and multiplication of probabilities, the concept of conditional probability, the formula for total probability, Bayes's formula, Bernoulli's scheme and theorem, the concepts of random variables, insufficiency of the mean value for the characterization of a random variable, methods of measuring the variance of a random variable, theorems on the standard deviation, the Chebyshev inequality, normal laws of distribution, distribution curves, properties of normal distribution curves, and related topics. The book is unique in that, while there are several high school and college textbooks available on this subject, there is no other popular treatment for the layman that contains quite the same material presented with the same degree of clarity and authenticity. Anyone who desires a fundamental grasp of this increasingly important subject cannot do better than to start with this book. New preface for Dover edition by B. V. Gnedenko. **Concrete Solutions 2014** *CRC Press* The Concrete Solutions series of International Conferences on Concrete Repair began in 2003 with a conference held in St. Malo, France in association with INSA Rennes. Subsequent conferences have seen us partnering with the University of Padua in 2009 and with TU Dresden in 2011. This conference is being held for the first time in the UK, in association with Queen's University Belfast and brings together delegates from 36 countries to discuss the latest advances and technologies in concrete repair. Earlier conferences were dominated by electrochemical repair, but there has been an interesting shift to more unusual methods, such as bacterial repair of concrete plus an increased focus on service life design aspects and modelling, with debate and discussion on the best techniques and the validity of existing methods. Repair of heritage structures is also growing in importance and a number of the papers have focused on the importance of getting this right, so that we may preserve

our rich cultural heritage of historic structures. This book is an essential reference work for those working in the concrete repair field, from Engineers to Architects and from Students to Clients. **Integrated Design and Simulation of Chemical Processes** *Elsevier* This comprehensive work shows how to design and develop innovative, optimal and sustainable chemical processes by applying the principles of process systems engineering, leading to integrated sustainable processes with 'green' attributes. Generic systematic methods are employed, supported by intensive use of computer simulation as a powerful tool for mastering the complexity of physical models. New to the second edition are chapters on product design and batch processes with applications in specialty chemicals, process intensification methods for designing compact equipment with high energetic efficiency, plantwide control for managing the key factors affecting the plant dynamics and operation, health, safety and environment issues, as well as sustainability analysis for achieving high environmental performance. All chapters are completely rewritten or have been revised. This new edition is suitable as teaching material for Chemical Process and Product Design courses for graduate MSc students, being compatible with academic requirements world-wide. The inclusion of the newest design methods will be of great value to professional chemical engineers. Systematic approach to developing innovative and sustainable chemical processes Presents generic principles of process simulation for analysis, creation and assessment Emphasis on sustainable development for the future of process industries