

# CHEMICAL ENGINEERING

## COMPUTER-AIDED ANALYSIS IN HEAT TRANSFER

J. ALAN ADAMS and DAVID F. ROGERS, both of the United States Naval Academy. 1973, 480 pages, \$17.00

A balanced approach between theory and analysis/application of that theory is presented for all three modes of heat transfer. A thorough development of the methods for formulating mathematical models in terms of non-dimensional parameters is stressed. Well documented, interactive computer programs, written in the BASIC programming language, are an integral part of the text.

## SOLIDIFICATION PROCESSES

MERTON C. FLEMINGS, Massachusetts Institute of Technology. 384 pages (tent.), \$16.50 (tent.). Available October, 1973.

Containing information not otherwise available to the general reader, SOLIDIFICATION PROCESSES is the only significant book in its field at the present time. Treating the fundamentals of solidification processing and relating these fundamentals to practice, this text builds on the foundations of heat flow, mass transport, and interface kinetics. Covering the engineering side of solidification processes in depth, this book offers also a cohesive treatment of fluid flow in solidification and thorough treatment of structure-property relations of solidified materials.

## OPTIMIZATION TECHNIQUES WITH FORTRAN

JAMES L. KUESTER, Arizona State University and JOE H. MIZE, Oklahoma State University. 1973, 412 pages (tent.), \$6.95 (tent.). With the publication of this book, there is now a current available central source of FORTRAN coded algorithms for a broad spectrum of optimization techniques. When used as a supplementary text in optimization and operations research courses in mathematics, engineering, business, statistics or physical science curriculums, the provided computer programs permit the instructor to assign realistic problems for which manual calculations would be too burdensome.

## METALLURGICAL THERMODYNAMICS

DAVID R. GASKELL, University of Pennsylvania. 1973, 500 pages (tent.), \$19.50 (tent.) This new text provides a systematic illustration of the application of modern thermodynamics to the determination of equilibria in metallurgical

systems. After discussing the basic laws and introducing the necessary thermodynamics functions, application is made to increasingly complex systems in the sequence, reactions between gases, reactions between gases and pure condensed phases, reactions between gases and condensed solutions, reactions in condensed solutions and electrochemical reactions.

## PROCESS MODELING, SIMULATION, AND CONTROL FOR CHEMICAL ENGINEERS

WILLIAM L. LUYBEN, Lehigh University. *McGraw-Hill Series in Chemical Engineering*. 1973, 558 pages, \$18.50

Professor Luyben has devoted his book to presenting only useful, state-of-the-art, applications-oriented tools and techniques most helpful for understanding and solving practical dynamics and control problems in chemical engineering systems. Written for the undergraduate student, this text offers a *unified, integrated* treatment of mathematical modeling, computer simulation, and process control.

## APPLIED STATISTICAL MECHANICS: Thermodynamic and Transport Properties of Fluids

THOMAS M. REED and KEITH E. GUBBINS, both of the University of Florida. *McGraw-Hill Series in Chemical Engineering*. 1973, 496 pages, \$18.50

With an emphasis on applications, APPLIED STATISTICAL MECHANICS is an introduction to the various ways in which statistical thermodynamics and kinetic theory can be applied to systems of chemical and engineering interest. Presented is a fundamental, up-to-date treatment of statistical-mechanics with primary interest focused on molecular theory as a basis for correlating and predicting physical properties of gases and liquids. Material on recent theoretical approaches such as perturbation theory and the statistical-mechanics of nonspherical molecules is included.

## AN INTRODUCTION TO ENGINEERING HEAT TRANSFER

JOHN R. SIMONSON, The City University, London. *McGraw-Hill Series in Mechanical Engineering*. 1973, 244 pages (tent.), \$10.50 (tent.)

With the guidance of this step-by-step introduction to the subject of heat transfer, the student is exposed to almost every aspect taught at the undergraduate level in engineering courses. In

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addition to the British units utilized, the new S.I. units are incorporated into the illustrative examples within the text. For the industrial reader, the treatment covers the transfer unit approach to heat exchanger design and the electrical analog network approach to radiation problems, as well as some of the latest empirical equations of convective heat transfer.

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## CONSERVATION OF MASS AND ENERGY

JOHN C. WHITWELL and RICHARD K. TONER, both of Princeton University. 1973, 500 pages (tent.), \$12.95 (tent.)

Unique in chemical engineering literature is the treatment of degrees of freedom for material and energy balances. Either chemical or physical processing elements are handled in a unified manner. The authors have included the first law of thermodynamics, unsteady state mass and energy balances, and all pertinent physical chemistry required. The modular organization of material offers the instructor a wide choice for his particular syllabus.

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## HEAT TRANSFER, Third Edition

JACK P. HOLMAN, Southern Methodist University. 1972, 496 pages, \$13.50

This elementary text offers a brief and concise treatment of *all* phases of heat transfer. New features include chapters on environmental problems, emphasis on numerical techniques in conduction problems and an increase in text examples.

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## ENGINEERING THERMODYNAMICS

WILLIAM C. REYNOLDS, Stanford University and HENRY C. PERKINS, University of Arizona. 1970, 544 pages, \$13.95. *Instructor's Manual*. Develops the fundamentals of thermodynamics using microscopic insight as the basis for macroscopic postulates, and then applies the statistical concepts developed to actual engineering systems.

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## THERMODYNAMICS, Second Edition

WILLIAM C. REYNOLDS, Stanford University. 1968, 512 pages, \$13.50. *Instructor's Manual*.

Using the basic conceptual ideas of statistical thermodynamics rather than the details, this principles of thermodynamics using microscopic fundamental text develops basic macroscopic insight.

## MOMENTUM, ENERGY, AND MASS TRANSFER IN CONTINUA

JOHN C. SLATTERY, Northwestern University. 1971, 704 pages, \$19.50

An integrated introduction for the first-year graduate student which offers original treatment of four subjects often taught separately: fluid mechanics, thermodynamics, heat transfer and mass transfer.

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## THERMODYNAMICS, Second Edition

KENNETH WARK, JR., Purdue University. 1971, 778 pages, \$16.50. *Solutions Manual*.

Providing an understanding of the basic laws of thermodynamics, the major portion of this text is developed from a set of postulates and definitions based on a macroscopic outlook on matter. In this major revision, the concept of entropy and the second law of thermodynamics are now approached via separate and independent classical and statistical viewpoints.

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## FLUID MECHANICS

THEODORE ALLEN, JR., and RICHARD L. DITSWORTH, both of Arizona State University. 1972, 415 pages, \$15.50

Offers a unified treatment of fluid mechanics utilizing the student's background in thermodynamics and dynamics. Vectors are employed to formulate those physical laws which pertain to continuum fluid mechanics and a large number of illustrated problems is included.

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## ANALYSIS OF HEAT AND MASS TRANSFER

E.R.G. ECKERT, University of Minnesota and ROBERT M. DRAKE, JR., Vice-President, *Combustion Engineering*, Windsor, Connecticut. *McGraw-Hill Series in Mechanical Engineering*. 1972, 750 pages, \$21.50

Acquaints the senior or graduate level student with the fundamentals of heat and mass transfer. Unlike most other books at this level, this single volume covers conduction, convection, and radiation.

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