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Solution

Manual

Even

Problems

A solid introduction,
enabling the reader to
successfully
formulate, construct,
simplify, evaluate and

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use mathematical models in chemical engineering.

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this

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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

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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

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chapter exercises, plus
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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

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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

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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

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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

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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

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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

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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

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coverage of equipment
Even Problems
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

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downloading from the

companion website

Extensive instructor

resources: 1170

lecture slides plus fully

worked solutions

manual available to

adopting instructors

Market_Desc: .

Chemical Engineers in

Chemical, Nuclear and

Biomedical Industries

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Special Features: ·
Emphasis is placed throughout on the development of common design strategy for all systems, homogeneous and heterogeneous. This edition features new topics on biochemical systems, reactors with fluidized solids, gas/liquid

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reactors, and more on non ideal flow. The

book explains why certain assumptions are made, why an alternative approach is not used, and to

indicate the limitations of the treatment when applied to real

situations About The Book: Chemical

reaction engineering is

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concerned with the exploitation of chemical reactions on a commercial scale. Its goal is the successful design and operation of chemical reactors. This text emphasizes qualitative arguments, simple design methods, graphical procedures, and frequent comparison

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of capabilities of the major reactor types.

Simple ideas are treated first, and are then extended to the more complex.

Process Engineering, the science and art of transforming rawmaterials and energy into a vast array of commercial materials,

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was conceived at the end of the 19th Century. Its history in the role of the Process Industries has been quite honorable, and techniques and products have contributed to improve health, welfare and quality of life. Today, industrial enterprises, which are

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still a major source of wealth, have to deal with new challenges in a global world. They need to reconsider their strategy taking into account environmental constraints, social requirements, profit, competition, and resource depletion. “Systems

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thinking” is a prerequisite from processdevelopment at the lab level to good project management. Newmanufacturing concepts have to be considered, taking into accountLCA, supply chain management, recycling, plant flexibility,continuous development, process

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intensification and innovation. This book combines experience from academia and industry in the field of industrialization, i.e. in all processes involved in the conversion of research into successful operations. Enterprises are facing major challenges in a

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world of fierce
competition
and globalization.
Process engineering
techniques provide
Process Industries with
the necessary tools to
cope with these issues.
The chapters of this
book give a new
approach to the
management
of technology, projects

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and manufacturing.

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Contents Part 1: The

Company as of Today

1. The Industrial

Company: its Purpose,

History, Context, and

its Tomorrow?, Jean-

Pierre Dal Pont. 2.

The Two Modes of

Operation of the

Company –

Operational and

Entrepreneurial, Jean-

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Pierre Dal Pont. 3.

The Strategic

Management of the
Company: Industrial

Aspects, Jean-Pierre

Dal Pont. Part 2:

Process Development
and Industrialization 4.

Chemical Engineering
and Process

Engineering, Jean-

Pierre DalPont. 5.

Foundations of

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Industrialization, Jean-François Joly. 6. The Industrialization Process: Preliminary Projects, Jean-Pierre Dal Pont and Michel Royer. 7. Lifecycle Analysis and Eco-Design: Innovation Tools for Sustainable Industrial Chemistry,

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Sylvain Caillol. 8.
Methods for Design
and Evaluation of
Sustainable Processes
and Industrial Systems,

Catherine Azzaro-

Pantel. 9. Project

Management

Techniques:

Engineering, Jean-

Pierre DalPont. Part 3:

The Necessary

Adaptation of the

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Company for
theFuture 10. Japanese
Methods, Jean-Pierre
Dal Pont. 11.
Innovation in
Chemical Engineering
Industries, Oliver
Potierand Mauricio
Camargo. 12. The
Place of Intensified
Processes in the Plant
of the Future, Laurent
Falk. 13. Change

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Management, Jean-
Pierre Dal Pont. 14.

The Plant of the
Future, Jean-Pierre
Dal Pont.

Fluidization

Engineering

GNU Octave

Chemical Reaction

Engineering

Engineering

Thermodynamics

Chemical Reactor

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Omnibook- soft cover
Solving problems in
chemical reaction
engineering and
kinetics is now
easier than ever! As
students read
through this text,
they'll find a
comprehensive,
introductory
treatment of
reactors for single-

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phase and multiphase systems that exposes them to a broad range of reactors and key design features.

They'll gain valuable insight on reaction kinetics in relation to chemical reactor design. They will also utilize a special software package

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that helps them quickly solve systems of algebraic and differential equations, and perform parameter estimation, which gives them more time for analysis.

Key Features

Thorough coverage is provided on the relevant principles

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of kinetics in order to develop better designs of chemical reactors. E-Z Solve software, on CD-ROM, is included with the text. By utilizing this software, students can have more time to focus on the development of design models and

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on the interpretation
of calculated results.

The software also

facilitates

exploration and

discussion of

realistic, industrial

design problems.

More than 500

worked examples

and end-of-chapter

problems are

included to help

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students learn how to apply the theory to solve design problems. A web site, www.wiley.com/college/missen, provides additional resources including sample files, demonstrations, and a description of the E-Z Solve software.

Chemical reaction

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engineering is concerned with the exploitation of chemical reactions on a commercial scale. It's goal is the successful design and operation of chemical reactors.

This text emphasizes qualitative arguments, simple

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design methods,
graphical
procedures, and
frequent comparison
of capabilities of the
major reactor types.
Simple ideas are
treated first, and are
then extended to the
more complex.

Ross's classic
bestseller has been
used extensively by

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professionals and
Even Problems
as the primary text

for a first

undergraduate

course in applied

probability. With the

addition of several

new sections

relating to actuaries,

this text is highly

recommended by

the Society of

Actuaries.

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A Practical, Up-to-
Date Introduction to
Applied

Thermodynamics,
Including Coverage
of Process

Simulation Models
and an Introduction
to Biological

Systems

Introductory

Chemical

Engineering

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Thermodynamics,
Second Edition,
helps readers
master the
fundamentals of
applied
thermodynamics as
practiced today: with
extensive
development of
molecular
perspectives that
enables adaptation

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to fields including biological systems, environmental applications, and nanotechnology.

This text is distinctive in making molecular perspectives accessible at the introductory level and connecting properties with

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practical
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implications.

Features of the second edition include Hierarchical instruction with increasing levels of detail: Content requiring deeper levels of theory is clearly delineated in separate sections and chapters Early

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introduction to the
overall perspective

of composite

systems like

distillation columns,

reactive processes,

and biological

systems Learning

objectives, problem-

solving strategies

for energy balances

and phase

equilibria, chapter

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summaries, and
“important
equations” for every
chapter Extensive
practical examples,
especially coverage
of non-ideal
mixtures, which
include water
contamination via
hydrocarbons,
polymer
blending/recycling,

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oxygenated fuels,
hydrogen bonding,
osmotic pressure,
electrolyte solutions,
zwitterions and
biological
molecules, and
other contemporary
issues Supporting
software in formats
for both MATLAB®
and spreadsheets
Online supplemental

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sections and
resources including
instructor slides,
ConcepTests,
coursecast videos,
and other useful
resources

An Introduction to
Chemical
Engineering Kinetics
& Reactor Design
Modeling, Design,
and Simulation

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Discrete
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Mathematics with
Applications
Modeling and
Simulation of
Mineral Processing
Systems
Chemical
Engineering
Education
In this book, the
modelling of
dynamic chemical

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engineering processes is presented in a highly understandable way using the unique combination of simplified fundamental theory and direct hands-on computer simulation. The mathematics is

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kept to a minimum,
and yet the nearly
100 examples
supplied on
www.wiley-vch.de
illustrate almost
every aspect of
chemical
engineering
science. Each
example is
described in detail,
including the model

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equations. They are written in the modern user-friendly simulation language Berkeley Madonna, which can be run on both Windows PC and Power-Macintosh computers.

Madonna solves models comprising many ordinary

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differential equations using very simple programming, including arrays. It is so powerful that the model parameters may be defined as "sliders", which allow the effect of their change on the model behavior to

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be seen almost immediately. Data may be included for curve fitting, and sensitivity or multiple runs may be performed. The results can be seen simultaneously on multiple-graph windows or by using overlays. The resultant learning

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effect of this is tremendous. The examples can be varied to fit any real situation, and the suggested exercises provide practical guidance. The extensive experience of the authors, both in university teaching and international

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courses, is reflected in this well-balanced presentation, which is suitable for the teacher, the student, the chemist or the engineer. This book provides a greater understanding of the formulation and use of mass and

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energy balances for
chemical

engineering, in a
most stimulating
manner. This book
is a third edition,
which also includes
biological,
environmental and
food process
examples.

Learn Chemical
Reaction

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Engineering
through Reasoning,
Not Memorization
Essentials of
Chemical Reaction
Engineering is the
complete, modern
introduction to
chemical reaction
engineering for
today's
undergraduate
students. Starting

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from the strengths
of his classic

Elements of
Chemical Reaction
Engineering,

Fourth Edition, in
this volume H.

Scott Fogler added
new material and
distilled the

essentials for
undergraduate

students. Fogler's

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unique way of presenting the material helps students gain a deep, intuitive understanding of the field's essentials through reasoning, using a CRE algorithm, not memorization. He especially focuses on important new

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energy and safety issues, ranging from solar and biomass applications to the avoidance of runaway reactions. Thoroughly classroom tested, this text reflects feedback from hundreds of students at the

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University of Michigan and other leading universities. It also provides new resources to help students discover how reactors behave in diverse situations-including many realistic, interactive simulations on DVD-

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ROM. New
Coverage Includes
Greater emphasis
on safety: following
the
recommendations
of the Chemical
Safety Board (CSB),
discussion of
crucial safety
topics, including
ammonium nitrate
CSTR explosions,

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case studies of the
nitroaniline

explosion, and the

T2 Laboratories

batch reactor

runaway Solar

energy

conversions:

chemical, thermal,

and catalytic water

spilling Algae

production for

biomass Steady-

Online Library

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state nonisothermal
reactor design: flow
reactors with heat
exchange Unsteady-
state nonisothermal
reactor design with
case studies of
reactor explosions
About the DVD-
ROM The DVD
contains six
additional,
graduate-level

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chapters covering
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catalyst decay,

external diffusion

effects on

heterogeneous

reactions, diffusion

and reaction,

distribution of

residence times for

reactors, models

for non-ideal

reactors, and radial

and axial

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temperature variations in tubular reactions. Extensive additional DVD resources include Summary notes, Web modules, additional examples, derivations, audio commentary, and self-tests

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Interactive
computer games
that review and
apply important
chapter concepts
Innovative "Living
Example Problems"
with Polymath code
that can be loaded
directly from the
DVD so students
can play with the
solution to get an

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innate feeling of
how reactors
operate A 15-day
trial of
Polymath(tm) is
included, along
with a link to the
Fogler Polymath
site A complete,
new AspenTech
tutorial, and four
complete example
problems Visual

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Encyclopedia of
Equipment, Reactor

Lab, and other

intuitive tools More
than 500

PowerPoint slides
of lecture notes

Additional updates,
applications, and

information are

available at www.umich.edu/~essen

and www.essentials

and www.essentials

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ofcre.com.
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Here is a comprehensive and comprehensible treatment of engineering thermodynamics from its theoretical foundations to its applications in real situations. The thermodynamics presented will

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prepare students
for later courses in
fluid mechanics
and heat transfer,
and practicing
engineers will find
the applications
helpful in their
professional work.

The book is
appropriate for an
introductory
undergraduate

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course in
thermodynamics
and for a
subsequent course
in thermodynamic
applications. The
chapters dealing
with steam power
plants, internal
combustion engines,
and HVAC are
unmatched. The
introductory

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chapter on
turbomachinery is
also unique. A
thorough
development of the
second law of
thermodynamics is
provided in
chapters 7-9. The
ramifications of the
second law receive
thorough
discussion; the

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student not only performs calculations, but understands the implications of the calculated results. Computer models created in TK Solver accompany each chapter and are particularly useful in the application

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areas. The TK Solver files provided with the book can be used as written or modified and merged into models developed to analyze new problems. The book has two particularly important strengths: its

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readability and the depth of its treatment of applications. The readability will make the content understandable to the average students; the depth in applications will make the book suitable for applied upper-level courses

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as well.

The third edition of Engineering Flow and Heat Exchange is the most practical textbook available on the design of heat transfer and equipment. This book is an excellent introduction to real-world applications

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for advanced
undergraduates
and an
indispensable
reference for
professionals. The
book includes
comprehensive
chapters on the
different types and
classifications of
fluids, how to
analyze fluids, and

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where a particular fluid fits into a broader picture.

This book includes various a wide variety of problems and solutions - some whimsical and others directly from industrial applications.

Numerous practical examples of heat

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transfer Different
from other
introductory books
on fluids Clearly
written, simple to
understand, written
for students to
absorb material
quickly Discusses
non-Newtonian as
well as Newtonian
fluids Covers the
entire field

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concisely Solutions
manual with

worked examples

and solutions

provided

Engineering Flow

and Heat Exchange

Bioprocess

Engineering

Principles

Fundamentals of

Chemical Reaction

Engineering

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Information
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Technology Project
Management
Introductory
Chemical
Engineering
Thermodynamics
Written by a
highly regarded
author with
industrial and
academic
experience, this

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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

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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

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Excel
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spreadsheets to enable students to carry out complex calculations.

"The fourth edition of Elements of Chemical Reaction Engineering is a completely revised version

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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,

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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

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reasoning,
rather than by
memorizing equat
ions." --BOOK
JACKET.

Separation
Process
Principles with
Applications
Using Process
Simulator, 4th
Edition is the
most
comprehensive

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and up-to-date
treatment of the
major separation
operations in
the chemical
industry. The
4th edition
focuses on using
process
simulators to
design
separation
processes and
prepares readers

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for professional
practice.

Completely
rewritten to
enhance clarity,
this fourth
edition provides
engineers with a
strong
understanding of
the field. With
the help of an
additional co-
author, the text

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presents new information on bioseparations throughout the chapters. A new chapter on mechanical separations covers settling, filtration and centrifugation including mechanical separations in

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biotechnology
and cell lysis.

Boxes help
highlight
fundamental
equations.

Numerous new
examples and
exercises are
integrated
throughout as
well.

Fluidization
Engineering,

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Second Edition,
expands on its
original scope
to encompass
these new areas
and introduces
reactor models
specifically for
these contacting
regimes.

Completely
revised and
updated, it is
essentially a

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new book. Its aim is to distill from the thousands of studies those particular developments that are pertinent for the engineer concerned with predictive methods, for the designer, and

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for the user and potential user of fluidized beds. Covers the recent advances in the field of fluidization. Presents the studies of developments necessary to the engineers, designers, and users of

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fluidized beds.
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Solutions Manual

Tools for Today

and Tomorrow

Multicomponent

Mass Transfer

Elements of

Chemical

Reaction

Engineering

Principles,

Practice and

Economics of

Plant and

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Process Design

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Dr. R. Peter King

**covers the field
of quantitative
modeling of
mineral
processing
equipment and
the use of these
models to
simulate the
actual behavior**

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**of ore dressing
and coal washing**

as they are

configured to

work in industrial

practice. The

material is

presented in a

pedagogical style

that is

particularly

suitable for

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readers who wish to learn the wide variety of modeling methods that have evolved in this field. The models vary widely from one unit type to another. As a result each model

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**is described in
some detail.**

**Wherever
possible model
structure is
related to the
underlying
physical
processes that
govern the
behaviour of
particulate**

**material in the
processing
equipment.
Predictive
models are
emphasised
throughout so
that, when
combined, they
can be used to
simulate the
operation of**

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**complex mineral
processing**

**flowsheets. The
development of
successful
simulation
techniques is a
major objective
of the work that
is covered in the
text. Covers all
aspects of**

Online Library
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Solution Manual
**modeling and
simulation**

**Provides all
necessary tools
to put the theory
into practice
The Omnibook
aims to present
the main ideas of
reactor design in
a simple and
direct way. it**

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includes key formulas, brief explanations, practice exercises, problems from experience and it skims over the field touching on all sorts of reaction systems. Most important of

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**all it tries to show
the reader how to
approach the
problems of
reactor design
and what
questions to ask.
In effect it tries to
show that a
common strategy
threads its way
through all**

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**reactor problems,
a strategy which
involves three
factors:
identifying the
flow patten,
knowing the
kinetics, and
developing the
proper
performance
equation. It is this**

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**common strategy
which is the heart
of Chemical
Reaction**

**Engineering and
identifies it as a
distinct field of
study.**

**Today, scientific
computing and
data analysis
play an integral**

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**part in most
scientific
disciplines
ranging from
mathematics and
biology to
imaging
processing and
finance. With
GNU Octave you
have a highly
flexible tool that**

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**can solve a vast
number of such
different
problems as
complex
statistical
analysis and
dynamical
system studies.**

**The GNU Octave
Beginner's Guide
gives you an**

Online Library

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Solution Manual

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**introduction that
enables you to
solve and
analyze
complicated
numerical
problems. The
book is based on
numerous
concrete
examples and at
the end of each**

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**chapter you will
find exercises to
test your
knowledge. It's
easy to learn
GNU Octave, with
the GNU Octave
Beginner's Guide
to hand. Using
real-world
examples the
GNU Octave**

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**Beginner's Guide
will take you
through the most
important
aspects of GNU
Octave. This
practical guide
takes you from
the basics where
you are
introduced to the
interpreter to a**

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**more advanced
level where you
will learn how to
build your own
specialized and
highly optimized
GNU Octave
toolbox package.
The book starts
by introducing
you to work
variables like**

**vectors and
matrices,
demonstrating
how to perform
simple arithmetic
operations on
these objects
before explaining
how to use some
of the simple
functionality that
comes with GNU**

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Octave, including plotting. It then goes on to show you how to write new functionality into GNU Octave and how to make a toolbox package to solve your specific problem. Finally, it demonstrates

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**how to optimize
your code and
link GNU Octave
with C and C++
code enabling
you to solve even
the most
computationally
demanding tasks.
After reading
GNU Octave
Beginner's Guide**

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you will be able
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to use and tailor

GNU Octave to

solve most

numerical

problems and

perform

complicated data

analysis with

ease.

This is the

Second Edition of

Page 115/184

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**the standard text
on chemical
reaction
engineering,
beginning with
basic definitions
and fundamental
principles and
continuing all the
way to practical
applications,
emphasizing real-**

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**world aspects of
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**practice. The two
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analysis and**

**design. Includes
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**coverage of
computer**

**modeling
methods and
many new
worked
examples. Most
of the examples
use real kinetic
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**to the Chemistry
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The Engineering
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specific surface*

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conditions to
provide the
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book will serve
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Design, and
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process control*

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software tools-
helping you
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on, using MATLAB-
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*Author B. Wayne
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dynamic modeling, feedback control, frequency response analysis techniques, control loop tuning, and start-to-finish chemical process control case studies.

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focuses
explicitly on
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and
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discrete
mathematics
underlie and
are essential
to today's
science and

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reasoning

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and computer simulations, and links theory to practice through many relevant examples. This updated second edition covers mole balances, conversion and reactor sizing,

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bioreactions

and

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more. Its
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improvements
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skills to real-life settings, Fogler presents three styles of problems:

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absorption;
stripping; and
more. In this
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engineering.

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contains

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models for the
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process
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process design.

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providing

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mathematical

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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

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engineering
course that
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show the power,
scope, and utility
of the subject.
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**of this
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applicability, Dr.
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problems from
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such as biology
and nuclear
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