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Engineering
Design Project A
Case Study
Approach Second
Edition
Project A
Case Study
Approach
Second
Edition

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Engineering

Design Project A

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Approach Second

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*An introduction
to the art and
practice of
design as
applied to
chemical
processes and
equipment. It
is intended
primarily as a
text for
chemical
engineering*

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students undertaking the design projects that are set as part of

undergraduate courses in chemical

engineering in the UK and USA.

It has been written to

complement the

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*treatment of
chemical
engineering
fundamentals
given in
Chemical
Engineering
volumes 1, 2
and 3. Examples
are given in
each chapter to
illustrate the
design methods*

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Engineering

presented.

Design Project A

This new

Case Study

edition of The

Approach Second

Expanding World

Edition

of Chemical

Engineering

provides an

overview of

recent and

future

developments in

chemical

engineering and

engineering and

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*future aspects
in chemical
engineering.*

*The book is
written by*

leading

*researchers in
various fields*

of expertise

*and covers most
important*

topics in

chemical

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*engineering.
The topics
covered
include;
computer
application,
material
design,
supercritical
fluid
technology,
colloid and
powder*

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Engineering

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*technology, new
equipment, bio
and medical
technology and
environmental
preservation
and
remediation.*

*This is a
valuable book
for students at
all levels as
well as for*

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Engineering

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*practitioners
in chemical
engineering and
industry.*

Chemical

Process

Engineering

presents a

systematic

approach to

solving design

problems by

listing the

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Engineering

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needed

equations,

calculating deg

rees-of-

freedom,

developing

calculation

procedures to

generate

process

specifications-

mostly

pressures,

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Engineering

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*temperatures,
compositions,
and flow rates-
and sizing*

*equipment. This
illustrative
reference/text
tabulates*

*numerous easy-
to-follow*

calculation

procedures as

well as the

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Engineering

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*relationships
needed for
sizing commonly
used equipment.*

*Taking a highly
pragmatic
approach to
presenting the
principles and
applications of
chemical
engineering,
this companion*

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Engineering
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*text for
students and
working
professionals
offers an
easily
accessible
guide to
solving
problems using
computers. The
primer covers
the core*

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*concepts of
chemical
engineering,
from
conservation
laws all the
way up to
chemical
kinetics,
without heavy
stress on
theory and is
designed to*

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Engineering
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*accompany
traditional
larger core
texts. The book
presents the
basic
principles and
techniques of
chemical
engineering
processes and
helps readers
identify*

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*typical
problems and
how to solve
them. Focus is
on the use of
systematic
algorithms that
employ
numerical
methods to
solve different
chemical
engineering*

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Engineering
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Edition

*problems by
describing and
transforming
the
information.*

*Problems are
assigned for
each chapter,
ranging from
simple to
difficult,
allowing
readers to*

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*gradually build
their skills
and tackle a
broad range of
problems.*

*MATLAB and
Excel® are used
to solve many
examples and
the more than
70 real
examples
throughout the*

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*book include
computer or
hand solutions,
or in many
cases both. The
book also
includes a
variety of case
studies to
illustrate the
concepts and a
downloadable
file containing*

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Edition

*fully worked
solutions to
the book's
problems on the
publisher's
website.*

*Introduces the
reader to
chemical
engineering
computation
without the
distractions*

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Engineering

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caused by the contents found in many texts.

Provides the principles

underlying all of the major

processes a chemical

engineer may

encounter as

well as offers

insight into

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Engineering

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*their analysis,
which is
essential for
design
calculations.*

*Shows how to
solve chemical
engineering
problems using
computers that
require
numerical
methods using*

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*standard
algorithms,
such as MATLAB®
and Excel®.
Contains
selective
solved examples
of many
problems within
the chemical
process
industry to
demonstrate how*

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*to solve them
using the
techniques
presented in
the text.*

*Includes a
variety of case
studies to
illustrate the
concepts and a
downloadable
file containing
fully worked*

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*solutions to
problems on the
publisher's
website. Offers
non-chemical
engineers who
are expected to
work with
chemical
engineers on
projects, scale-
ups and process
evaluations a*

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solid understanding of basic concepts of chemical engineering analysis, design, and calculations. Drug Product Design, Development, and Modeling

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Engineering

Basic Chemical

Design Project A

Case Study

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Chemical Edition

Engineering

Design Project

An Integrated

Engineering

Design for

Advanced

Materials

The Integration

of Process

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*Design and
Control
Project A
Case Study
Management from
Inquiry to
Acceptance*

**"The most
complete, up-to-
date, problem-
solving toolkit
for chemical
engineers and**

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**process
designers.
Industrial
Chemical
Process Design,
Second Edition
provides a step-
by-step
methodology
and 25
downloadable,
customizable,**

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**needs-specific
software
applications
that offer quick,
accurate
solutions to
complex process
design
problems. These
applications
uniquely fill the
gaps left by**

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**large, very
expensive
commercial
process
simulation
software
packages used
to select, size,
and design
industrial
chemical
process**

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Engineering

equipment.

Design Project A

Written by a

Case Study

hands-on

Approach Second

industry

Edition

consultant and

featuring more

than 200

illustrations,

this book

thoroughly

details: Sizing

and cost

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**estimating of
process unit
operation
equipment
Design and
rating of
fractionation
equipment and
three-phase
separation
equipment
Chemical**

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optimization

Commercial

distillation

Packaged plant

cost analysis

Estimating cost

for modular

packages

Performing

operations such

as liquid-liquid

extraction and

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**gas liquid
separation
vessel sizing
and rating
Green
engineering
New to the
Second Edition:
Added focus on
sustainability
with new green
engineering**

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**coverage: crude
oil database;
vegetable oils
and plant
greenhouse
production for
use in
automobile
fuels; gasoline
and diesel fuel
database;
greenhouse**

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**fuels; water
removal
treatment in
three-phase
vessel design
New focus on
engineering
economics
Simplified
shell/tube
design method
and improved**

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**shell/tube
exchanger
software
improvements
Fluid flow
coverage
includes both
single- and two-
phase flow and
the very
desirable
addition of**

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**complete
process
engineering of
NOx removal
and catalytic
SCR reactor
processes
necessary in all
electric
generator
power plants
and refinery**

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**furnace systems
(per mandatory
EPA regulations)
Coverage of the
Fischer-Tropsch
process
converting
natural methane
gas to crude oil
products,
liquids,
gasoline, diesel,**

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**and jet fuel - all
sulfur-free!**

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**Includes a plan
to decrease**

reliance on

crude oil

imports

Contains a

packaged cost

analysis natural

gas-to-liquids

plant turn-key

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**software
program "--
A guide to the
important
chemical
engineering
concepts for the
development of
new drugs,
revised second
edition The
revised and**

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edition of
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Engineering in
the**

**Pharmaceutical
Industry offers a
guide to the
experimental
and
computational
methods related**

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**to drug product
design and
development.**

**The second
edition has been
greatly
expanded and
covers a range
of topics related
to formulation
design and
process**

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**development of
drug products.**

**The authors
review basic
analytics for
quantitation of
drug product
quality
attributes, such
as potency,
purity, content
uniformity, and**

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Engineering

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**dissolution, that
are addressed
with
consideration of
the applied
statistics,
process
analytical
technology, and
process control.
The 2nd Edition
is divided into**

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**two separate
books: 1) Active
Pharmaceutical
Ingredients
(API's) and 2)
Drug Product
Design,
Development
and Modeling.
The contributors
explore
technology**

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**transfer and
scale-up of
batch processes
that are
exemplified
experimentally
and
computationally
. Written for
engineers
working in the
field, the book**

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examines in-silico process modeling tools that streamline experimental screening approaches. In addition, the authors discuss the emerging field of continuous drug

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Engineering

product

manufacturing.

This revised

second edition:

Contains 21 new

or revised

chapters,

including

chapters on

quality by

design,

computational

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**approaches for
drug product
modeling,
process design
with PAT and
process control,
engineering
challenges and
solutions Covers
chemistry and
engineering
activities**

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**related to
dosage form
design, and
process
development,
and scale-up
Offers analytical
methods and
applied
statistics that
highlight drug
product quality**

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Engineering

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**attributes as
design features
Presents
updated and
new example
calculations and
associated
solutions
Includes
contributions
from leading
experts in the**

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**field Written for
pharmaceutical
engineers,
chemical
engineers,
undergraduate
and graduation
students, and
professionals in
the field of
pharmaceutical
sciences and**

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**manufacturing,
Chemical
Engineering in
the
Pharmaceutical
Industry,
Second Edition
contains
information
designed to be
of use from the
engineer's**

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**perspective and
spans**

**information
from solid to
semi-solid to**

**lyophilized drug
products.**

**This book offers
a**

**comprehensive
coverage of**

process

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**simulation and
flowsheeting,
useful for
undergraduate
students of
Chemical
Engineering and
Process
Engineering as
theoretical and
practical
support in**

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**Process Design,
Process
Simulation,
Process
Engineering,
Plant Design,
and Process
Control courses.
The main
concepts
related to
process**

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simulation and application tools are presented and discussed in the framework of typical problems found in engineering design. The topics presented in the chapters are

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**organized in an
inductive way,
starting from
the more
simplistic
simulations up
to some
complex
problems.
An invaluable
real-world guide
to managing**

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large-scale and

Design Project A

complex

Case Study

Engineering,

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Procurement,

Edition

Construction

and

Commissioning

(EPCC) projects

Engineering,

Procurement,

Construction

and

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Engineering

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**Commissioning
(EPCC)
infrastructure
projects require
engineers from
several
disciplines to
adhere to strict
budgetary,
scheduling, and
performance
parameters.**

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Engineering

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**Chemical
engineers
involved in EPCC
projects are
involved
primarily in
ensuring that
the process
plant is
designed
correctly and sa
fely—interacting**

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**with the client,
contributing to
feasibility
studies,
selecting
specific
technologies,
developing
process flow
diagrams, and
other key tasks.
Managing**

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Engineering
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**Engineering,
Procurement,
Construction,
and
Commissioning
Projects: A
Chemical
Engineer's
Guide clearly
defines the role
of a chemical
engineer in the**

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EPCC industry and provides detailed and systematic coverage of each phase of an EPCC project. Drawing from their extensive experience in process design, optimization,

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Engineering
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Case Study
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**and analysis,
the authors
identify and
discuss each
key task and
consideration
from a chemical
engineer's
perspective.
Topics include
scope and
process**

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Engineering

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**planning,
construction
support,
operator
training, safety
and viability
evaluation, and
detail
engineering.**

**Provides a
structured
overview of the**

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Engineering
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**various
challenges
chemical
engineers face
in each project
phase**

**Introduces the
essential
aspects of the
Engineering,
Procurement,
Construction**

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Engineering
and
Design Project A
Commissioning
Case Study
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Edition
Describes the
roles of
chemical
process
engineers in
each phase of
EPCC projects
and in different
EPCC industry

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**positions
Discusses the
interaction of
process
engineers with
other disciplines
and clients
Managing
Engineering,
Procurement,
Construction,
and**

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**Commissioning
Projects: A
Chemical
Engineer's
Guide is a must-
have resource
for chemists in
industry,
process
engineers,
chemical
Engineers,**

Page 72/264

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**engineering
consultants, and
project
managers and
planners
working on
EPCC projects
across the
chemical
Industry.
Analysis,
Synthesis and**

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Engineering
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**Design of
Chemical
Processes
A Case Study
Approach
Process
Equipment and
Plant Design
The Expanding
World of
Chemical
Engineering**

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**Industrial
Process
Engineering and
Plant Design
Chemical
Engineering
Design and
Analysis**

*This
comprehensive
work shows how
to design and*

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Engineering

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Case Study

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Edition

***develop
innovative,
optimal and
sustainable
chemical
processes by
applying the
principles of
process systems
engineering,
leading to
integrated***

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Engineering

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Edition.

***sustainable
processes with
'green'
attributes.
Generic
systematic
methods are
employed,
supported by
intensive use of
computer
simulation as a***

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Engineering

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***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***

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Engineering

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***chemicals,
process
intensification
methods for
designing
compact
equipment with
high energetic
efficiency,
plantwide
control for
managing the***

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***key factors
affecting the
plant dynamics
and operation,
health, safety
and
environment
issues, as well
as sustainability
analysis for
achieving high
environmental***

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performance. All chapters are completely rewritten or have been revised. This new edition is suitable as teaching material for Chemical Process and

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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

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***professional
chemical
engineers.
Systematic
approach to
developing
innovative and
sustainable
chemical
processes
Presents generic
principles of***

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Engineering
**process
simulation for
analysis,
creation and
assessment**
**Emphasis on
sustainable
development for
the future of
process
industries**
Chemical

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Design Project A**

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Press

**"The book
provides the
whole horizon of
process
engineering and**

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***plant design
from concept
phase through
the execution to
commissioning
of the plant in
the real
practice.***

***Providing a
complete
industrial
perspective. The***

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***book covers the
pertinent
guidelines and
standards and
how engineering
documents are
generated using
these standards
with topics as
Hazardous Area
Classification,
Relief System***

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Engineering

***Design, Revamp
Engineering,
Interaction with
Other***

***Disciplines, and
Pre-***

***commissioning
and***

Commissioning.

***The concepts
are supported
by illustrated***

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practical examples. It also deals with decision making processes on strategic level, management tasks and leading functions beside the technical know-how"--

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***This practical
how-to-do book
deals with the
design of
sustainable
chemical
processes by
means of
systematic
methods aided
by computer
simulation.***

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Ample case studies illustrate generic creative issues, as well as the efficient use of simulation techniques, with each one standing for an important issue

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***taken from
practice. The
didactic
approach guides
readers from
basic knowledge
to mastering
complex flow-
sheets, starting
with chemistry
and thermodyna
mics, via***

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***process
synthesis,
efficient use of
energy and
waste
minimization,
right up to plant-
wide control and
process
dynamics. The
simulation
results are***

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***compared with
flow-sheets and
performance
indices of actual
industrial
licensed
processes, while
the complete
input data for
all the case
studies is also
provided,***

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***allowing readers
to reproduce the
results with
their own
simulators. For
everyone
interested in the
design of
innovative
chemical
processes.
Principles,***

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***Practice and
Economics of
Plant and
Process Design
Environmentally
Conscious
Design of
Chemical
Processes
A Practical
Approach to
Chemical***

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***Engineering for
Non-Chemical***

Engineers

Chemical

Process Design

Guidelines for

Engineering

Design for

Process Safety

Coulson &

Richardson's

Chemical

Page 97/264

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***Engineering
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***

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Engineering

**sound chemical
Design Project A
engineering.**

Analysis,

Synthesis, and

Design of

Chemical

Processes,

Third Edition,

presents design

as a creative

process that

integrates both

the big picture

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Engineering

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Case Study

Approach Second

Editor

***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***

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Engineering
Design Project A
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***process
problem
solving. The
authors
introduce
integrated
techniques for
every facet of
the discipline,
from finance to
operations, new
plant design to
existing process***

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Engineering

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,

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***including
realistic
examples of
equipment
sizing for batch
sequencing;
batch
scheduling for
multi-product
plants;
improving
production via
intermediate***

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**storage and
parallel
equipment; and
new**

optimization

techniques

specifically for

batch

processes.

Coverage

includes

Conceptualizing

and analyzing

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***chemical
processes: flow
diagrams,
tracing, process
conditions, and
more Chemical
process
economics:
analyzing
capital and
manufacturing
costs, and
predicting or***

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assessing
Design Project A
profitability
Case Study
Synthesizing
Approach Second
and optimizing
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chemical
processing: exp
erience-based
principles,
BFD/PFD,
simulations,
and more
Analyzing
process

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**performance via
I/O models,**

performance

curves, and

other tools

Process

troubleshooting

**and “debottlene
cking”**

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engineering

design and

society: ethics,

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**professionalism
, health, safety,
and new “green
engineering”
techniques**

**Participating
successfully in
chemical
engineering
design teams**

**Analysis,
Synthesis, and
Design of**

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Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested

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***curricula for
both single-
semester and
year-long
design courses;
case studies
and design
projects with
practical
applications;
and appendixes
with current
equipment cost***

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data and preliminary design information for eleven chemical processes-including seven brand new to this edition.

An Applied Guide to Process and Plant Design,

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2nd edition, is a guide to process plant design for both students and professional engineers. The book covers plant layout and the use of spreadsheet programs and key drawings

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***produced by
professional
engineers as
aids to design;
subjects that
are usually
learned on the
job rather than
in education.***

***You will learn
how to produce
smarter plant
design through***

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Engineering

Design Project A

Case Study

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Editor

***the use of
computer tools,
including Excel
and AutoCAD,
“What If
Analysis,
statistical tools,
and Visual
Basic for more
complex
problems. The
book also
includes a***

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***wealth of
selection tables,
covering the
key aspects of
professional
plant design
which
engineering
students and
early-career
engineers tend
to find most
challenging.***

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***Professor
Moran draws on
over 20 years'
experience in
process design
to create an
essential
foundational
book ideal for
those who are
new to process
design,
compliant with***

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both professional practice and the IChemE degree accreditation guidelines. Includes new and expanded content, including illustrative case studies and

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***practical
examples
Explains how to
deliver a
process design
that meets both
business and
safety criteria
Covers plant
layout and the
use of
spreadsheet
programs and***

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Engineering

***key drawings as
aids to design***

Includes a

comprehensive

set of selection

tables, covering

aspects of

professional

plant design

which early-

career

designers find

most

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***challenging
This book has
been prepared
to demonstrate
how chemical
and process
engineering
principles can
be applied to
the design of
process
equipment, by
reference to the***

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***UK's Institution
of Chemical
Engineers
(IChemE)
Design Project
Examination
question set in
1989 which the
author
undertook and
passed. The
object is to
demonstrate***

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Engineering

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***the application
of principles,
rather than to
design a plant
to produce
Carbon
Disulphide
(CS₂) from
Natural Gas and
Sulphur Feed
Stocks in every
detail. Although
written***

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Engineering

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***primarily to
meet the needs
of candidates
preparing for
the UK***

***Institution of
Chemical
Engineers
(IChemE)***

***Design Project
Examination,
the work, being
concerned with***

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Engineering

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Approach Second

Edition

***the practical
application of
basic
principles, will
be of value to
all chemical
and process
engineers
including
students at
both
undergraduate
and***

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Engineering

**postgraduate
levels.**

Chemical

Engineering

Design, Second

Edition, deals

with the

application of

chemical

engineering

principles to

the design of

chemical

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Design Project A

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Approach Second

Edition

***processes and
equipment.***

Revised

throughout,

this edition has

been

specifically

developed for

the U.S.

market. It

provides the

latest US codes

and standards,

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***including API,
ASME and ISA
design codes
and ANSI
standards. It
contains new
discussions of
conceptual
plant design,
flowsheet
development,
and revamp
design;***

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Approach Second
Edition

***extended
coverage of
capital cost
estimation,
process costing,
and economics;
and new
chapters on
equipment
selection,
reactor design,
and solids
handling***

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Engineering
Design Project A
Case Study
Approach Second
Edition

***processes. A
rigorous
pedagogy
assists
learning, with
detailed worked
examples, end
of chapter
exercises, plus
supporting
data, and Excel
spreadsheet
calculations,***

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Engineering
**plus over 150
Patent
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downloading
from the
companion
website.
Extensive
instructor
resources,
including 1170
lecture slides
and a fully**

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worked solutions manual are available to adopting instructors.

This text is designed for chemical and biochemical engineering students (senior

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***undergraduate
year, plus
appropriate for
capstone design
courses where
taken, plus
graduates) and
lecturers/tutors
, and
professionals in
industry
(chemical
process,***

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Edition:

Revised

organization

into Part I:

Process Design,

and Part II:

Plant Design.

The broad

themes of Part I

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***are flowsheet
development,
economic
analysis, safety
and
environmental
impact and
optimization.
Part II contains
chapters on
equipment
design and
selection that***

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***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 conceptual
plant design,***

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***flowsheet
development
and revamp
design***

***Significantly
increased
coverage of
capital cost
estimation,
process costing
and economics
New chapters
on equipment***

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*selection,
reactor design
and solids
handling
processes New
sections on
fermentation,
adsorption,
membrane
separations, ion
exchange and
chromatograph
y Increased*

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***coverage of
batch
processing,
food,
pharmaceutical
and biological
processes All
equipment
chapters in Part
II revised and
updated with
current
information***

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Editor

***Updated
throughout for
latest US codes
and standards,
including API,
ASME and ISA
design codes
and ANSI
standards
Additional
worked
examples and
homework***

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***problems The
most complete
and up to date
coverage of
equipment
selection 108
realistic
commercial
design projects
from diverse
industries A
rigorous
pedagogy***

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learning, with

detailed worked

examples, end

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exercises, plus

supporting data

and Excel

spreadsheet

calculations

plus over 150

Patent

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plus fully

worked

solutions

manual

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instructors***

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Process Design

and Integration

Applications in

Design and

Simulation of

Sustainable

Chemical

Processes

Green

Engineering

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Chemical
Process Design,
2nd Edition***

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Chemical
Engineering
An Introduction
to Chemical
Engineering
Design***

A chemical engineer's
guide to managing

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and minimizing
environmental impact.

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Chemical processes
are invaluable to
modern society, yet
they generate
substantial quantities
of wastes and
emissions, and safely
managing these
wastes costs tens of
millions of dollars
annually. Green
Engineering is a

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complete

professional's guide to

the cost-effective

design, Approach Second

commercialization,

and use of chemical

processes in ways

that minimize pollution

at the source, and

reduce impact on

health and the

environment. This

book also offers

powerful new insights

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into environmental
risk-based
considerations in
design of processes
and products. First
conceived by the staff
of the U.S.

Environmental
Protection Agency,
Green Engineering
draws on
contributions from
many leaders in the
field and introduces

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advanced risk-based techniques including some currently in use at the EPA. Coverage includes: Engineering chemical processes, products, and systems to reduce environmental impacts Approaches for evaluating emissions and hazards of chemicals and processes

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Defining effective
environmental
performance targets
Advanced
approaches and tools
for evaluating
environmental fate
Early-stage design
and development
techniques that
minimize costs and
environmental
impacts In-depth
coverage of unit

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operation and
flowsheet analysis
The economics of
environmental
improvement projects
Integration of
chemical processes
with other material
processing operations
Lifecycle
assessments: beyond
the boundaries of the
plant Increasingly,
chemical engineers

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are faced with the challenge of integrating environmental objectives into design decisions. Green Engineering gives them the technical tools they need to do so.

A concise text for final year undergraduates, providing fundamental instruction for the

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completion of a
design project.

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study to the detailed

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and Plant Design:

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Principles and

Practices takes a

holistic approach

towards process

design in the chemical

engineering industry,

dealing with the

design of individual

process equipment

and its configuration

as a complete

functional system.

Chapters cover typical

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heat and mass

transfer systems and

equipment included in

a chemical Second

edition engineering

curriculum, such as

heat exchangers, heat

exchanger networks,

evaporators,

distillation, absorption,

adsorption, reactors

and more. The

authors expand on

additional topics such

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as industrial cooling systems, extraction, and topics on process utilities, piping and hydraulics, including instrumentation and safety basics that supplement the equipment design procedure and help to arrive at a complete plant design. The chapters are arranged in sections pertaining

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to heat and mass transfer processes, reacting systems, plant hydraulics and process vessels, plant auxiliaries, and engineered safety as well as a separate chapter showcasing examples of process design in complete plants. This comprehensive reference bridges the

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Editor

gap between industry and academia, while exploring best practices in design, including relevant theories in process design making this a valuable primer for fresh graduates and professionals working on design projects in the industry. Serves as a consolidated resource for process

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and plant design,
including process

utilities and

engineered safety

Bridges the gap

between industry and
academia by including

practices in design

and summarizing

relevant theories

Presents design

solutions as a

complete functional

system and not

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Provides design

procedures as pseudo-

code/flow-chart, along

with practical

considerations

Applications in Design

and Simulation of

Sustainable Chemical

Processes addresses

the challenging

applications in

designing eco-friendly

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but efficient chemical processes, including recent advances in chemistry and catalysis that rely on renewable raw materials. Grounded in the fundamental knowledge of chemistry, thermodynamics, chemical reaction engineering and unit operations, this book

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is an indispensable resource for developing and designing innovating chemical processes by employing computer simulations as an efficient conceptual tool.

Targeted to graduate and post graduate students in chemical engineering, as well as to professionals,

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the book aims to advance their skills in process innovation and conceptual design. The work completes the book Integrated Design and Simulation of Chemical Processes by Elsevier (2014) authored by the same team. Includes comprehensive case studies of innovative

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processes based on
renewable raw

materials Outlines

Process Systems

Engineering approach

with emphasis on

systematic design

methods Employs

steady-state and

dynamic process

simulation as problem

analysis and

flowsheet creation

tool Applies modern

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Integrated Design and
Simulation of
Chemical Processes
A Guide to Chemical
Engineering Process
Design and
Economics
Chemical Process
Engineering

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Chemical Product
Design Project A
Sustainability in the
Design, Synthesis
and Analysis of
Chemical Engineering
Processes
A Case Study
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Upper-level
undergraduate text
for process design
courses in chemical

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engineering.

Design Project A
Introduces students

Case Study
to the technology

Approach Second
and terminology

Edition
they will encounter

in industrial

practice. Presents

short-cut techniques

for specifying

equipment or

isolating important

elements of a design

project. Emphasizes

project definition,

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flow sheet development and equipment specification. Covers the economics of process design. End-of-chapter exercises guide students through step-by-step solutions of design problems. Includes four case studies from past

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Engineering Design

for Advanced

Materials" focuses

on the application of

this technology to

engineering

coatings and, in

particular, to the

manufacture of high

performance

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materials, such as fibre reinforced ceramic composite materials, for structural applications at high temperatures. This book aims to provide a thorough exploration of the design and applications of advanced materials, and their

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manufacture in
engineering. From
physical
fundamentals and
principles, to
optimization of
processing
parameters and
other current
practices, this book
is designed to guide
readers through the
development of both
high performance

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materials and the
design of CVD

systems to

manufacture such

materials. "Chemical

Vapour Deposition:

An Integrated

Engineering Design

for Advanced

Materials"

introduces

integrated design

and manufacture of

advanced materials

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to researchers,
industrial
practitioners,
postgraduates and
senior
undergraduate
students.

Traditionally,
process design and
control system
design are
performed
sequentially. It is
only recently

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displayed that a simultaneous approach to the design and control leads to significant economic benefits and improved dynamic performance during plant operation.

Extensive research in issues such as 'interactions of design and control',

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'analysis and design of plant wide control systems', 'integrated methods for design and control' has resulted in impressive advances and significant new technologies that have enriched the variety of instruments available for the

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design engineer in her endeavour to design and operate new processes. The field of integrated process design and control has reached a maturity level that mingles the best from process knowledge and understanding and control theory on one side, with the

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best from numerical analysis and optimisation on the other. Direct implementation of integrated methods should soon become the mainstream design procedure. Within this context 'The Integration of Process Design and Control', bringing

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together the developments in a variety of topics related to the integrated design and control, will be a real asset for design engineers, practitioners and researchers.

Although the individual chapters reach a depth of analysis close to the

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frontier of current research status, the structure of the book and the autonomous nature of the chapters make the book suitable for a newcomer in the area. The book comprises four distinct parts: Part A: Process characterization and

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controllability

Design Project A
analysis Part B:

Integrated process

design and control

⊣ Methods

Part C: Plant wide

interactions of

design and control

Part D: Integrated

process design and

control ⊣

Extensions By the

end of the book, the

reader will have

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developed a
commanding
comprehension of
the main aspects of
integrated design
and control, the
ability to critically
assess the key
characteristics and
elements related to
the interactions
between design and
control and the
capacity to

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Appendix Second

Edition

implement the new
technology in

practice. * This book

brings together the

latest developments

in a variety of topics

related to integrated

design and control. *

It is a valuable asset

for design

engineers,

practitioners and

researchers. * The

structure of the

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book and the nature of its chapters also make it suitable for a newcomer to the field.

This 1998 book introduces the basics of engineering design and analysis for beginning chemical engineering undergraduate students.

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Basic®, Second
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Principles and
Practices
For Chemical
Engineers and
Students

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Engineer's Guide

Chemical

Projects Scale

Up: How to Go

from Laboratory

to Commercial

covers the

chemical

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*engineering
steps necessary
for taking a
laboratory
development
into the
commercial
world. The book
includes the
problems
associated with
scale up,*

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*equipment
sizing
considerations,
thermal
characteristics
associated with
scale up, safety
areas to
consider,
recycling
considerations,
operability*

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*reviews and
economic
viability. In
addition to the
process design
aspects of
commercializing
the laboratory
development,
consideration is
given to the
utilization of a*

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*development in
an existing
plant. Explains
how heat
removal for
exothermic
reactions can be
scaled up
Outlines how a
reactor can be
sized from batch
kinetic data*

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*Discusses how
the plant
performance of
a new catalyst
can be*

evaluated

*Presents how
the economics
of a new
product/process
can be
developed*

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Engineering

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Approach Second

Edition

*Discusses the
necessary
evaluation of
recycling in
commercial
plants*

*A Practical
Approach to
Chemical
Engineering for
Non-Chemical
Engineers is*

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aimed at people who are dealing with chemical engineers or those who are involved in chemical processing plants. The book demystifies complicated chemical

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*engineering
concepts
through daily
life examples
and analogies. It
contains many
illustrations and
tables that
facilitate quick
and in-depth
understanding
of the concepts*

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*handled in the
book. By
studying this
book, practicing
engineers (non-
chemical),
professionals,
technicians and
other skilled
workers will gain
a deeper
understanding*

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Engineering
Design Project A
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*of what
chemical
engineers say
and ask for. The
book is also
useful for
engineering
students who
plan to get into
chemical
engineering and
want to know*

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*more on the
topic and any
related jargon.*

Provides

numerous

*graphs, images,
sketches, tables,
help better*

*understanding
of concepts in a
visual way*

Describes

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Engineering

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*complicated
chemical
engineering
concepts by
daily life
examples and
analogies,
rather than by
formula Includes
a virtual tour of
an imaginary
process plant*

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Explains the majority of units in chemical engineering

This book describes the fascinating wealth of activities as they occur in the design, construction and

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*commissioning
of a chemical
plant - a jigsaw
puzzle of the
work of*

*chemical
engineers,
chemists,
constructors,
architects,
electrical
engineers,*

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PDF Chemical
Engineering
process
Design Project A
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Edition
economists and
legal staff. The
author first
takes the reader
through the
conceptual
phase, in which
the economic
relevance and

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*environmental
impact need to
be considered
and
supplemented
by accurate
estimates of
capital
requirements
and profitability.
This phase ends
with the choice*

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Engineering
of an
Design Project A
appropriate
Case Study
engineering firm
Approach Second
and the
Edition
conclusion of
the contract,
after which the
reader is guided
through all
aspects of the
implementation
phase from the

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*engineering of
the chemical
plant to
commissioning,
equipment and
material
procurement,
the erection
phase and the
successful test
run, after which
the new facility*

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is handed over to its owner. The book also illustrates many potential sources of errors by means of examples from practice, and how, aside professional skills, teamwork

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Engineering
and
Design Project A
communication
Case Study
are also
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absolutely
essential to
keep such a
complex project
on track.

Development of
a new chemical
plant or process
from concept

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*evaluation to
profitable reality
is often an
enormously
complex
problem.*

*Generally, a
plant-design
project moves to
completion
through a series
of stages which*

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*may include
inception,
preliminary
evaluation of
economics and
market, data
development for
a final design,
final economic
evaluation,
detailed
engineering*

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design, procurement, erection, startup, and production. The general term plant design includes all of the engineering aspects involved in the development of

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*either a new,
modified, or
expanded
industrial plant.
In this context,
individuals
involved in such
work will be
making
economic
evaluations of
new processes,*

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designing individual pieces of equipment for the proposed new ventures, or developing a plant layout for coordination of the overall operation.

Because of the many design

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duties encountered, the engineer involved is many times referred to as a design engineer. If the latter specializes in the economic aspects of the design, the individual may

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*be referred to as
a cost engineer.*

*On the other
hand, if he or
she emphasizes*

*the actual
design of the
equipment and
facilities*

*necessary for
carrying out the
process, the*

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Engineering

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*individual may
be referred to as
a process design
engineer. The
material*

*presented in this
book is intended
to aid the latter
in developing
rapid chemical
designs without
becoming*

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*unduly involved
in the often
complicated
theoretical
underpinnings of
these useful
notes, charts,
tables, and
equations.*

*Design And
Economics*

An Introduction

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*How to go from
Laboratory to
Commercial
Chemical
Engineering
Occupational
Outlook
Handbook
Guidelines for
Integrating
Process Safety
into Engineering*

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Engineering

Projects

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Written by a highly

regarded author with

industrial and

academic experience,

this new edition of an

established

bestselling book

provides practical

guidance for students,

researchers, and

those in chemical

engineering. The

book includes a new

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section on sustainable 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 Excel spreadsheets to enable students to carry out complex

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Engineering

calculations.

This updated version

of one of the most

popular and widely

used CCPS books

provides plant design

engineers, facility

operators, and safety

professionals with key

information on

selected topics

of interest. The book

focuses on process

safety issues in the

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designof chemical, petrochemical, and hydrocarbon processing facilities. It discusses how to select designs that can prevent or mitigate therelease of flammable or toxic materials, which could lead to a fire, explosion, or environmental damage. Key areas to

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be enhanced in the new edition include inherently safer design, specifically concepts for design of inherently safer unit operations and Safety Instrumented Systems and Layer of Protection Analysis. This book also provides an extensive bibliography to related publications

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Engineering

and topic-specific information, as

well as key

information on failure

modes and potential

design solutions.

Chemical Engineering

Volume 2 covers the

properties of

particulate systems,

including the

character of individual

particles and their

behaviour in fluids.

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Edition

Sedimentation of particles, both singly and at high concentrations, flow in packed and fluidised beds and filtration are then examined. The latter part of the book deals with separation processes, such as distillation and gas absorption, which illustrate applications of the

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Volume 1. In

conclusion, several

techniques of growing

importance -

adsorption, ion

exchange,

chromatographic and

membrane

separations, and

process intensification

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PDF Chemical

Engineering

- are described. * A logical progression of chemical engineering concepts, volume 2 builds on fundamental principles contained in Chemical Engineering volume 1 and these volumes are fully cross-referenced * Reflects the growth in complexity and stature of chemical engineering over the

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last few years*

Supported with further

reading at the end of

each chapter and

graded problems at

the end of the book

IMPROVE stands for

"Information

Technology Support

for Collaborative and

Distributed Design

Processes in

Chemical

Engineering" and is a

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Engineering

Design Project A

Case Study
at RWTH Aachen

University. This

Approach Second
Edition
volume summarizes

the results after 9

years of cooperative

research work. The

focus of IMRPOVE is

on understanding,

formalizing,

evaluating, and,

consequently,

improving design

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processes in chemical engineering. In

particular, IMPROVE

focuses on

conceptual design

and basic

engineering, where

the fundamental

decisions concerning

the design or redesign

of a chemical plant

are undertaken.

Design processes are

analyzed and

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Engineering

evaluated in
collaboration with

industrial partners.

Results of the

IMPROVE Project

Process Analysis and

Simulation in

Chemical Engineering

Computer-Aided Case

Studies

A Worked Solution to

the Production of 80

000 Tones/Year of

Carbon Disulphide

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Engineering
From Natural Gas and
Design Project A
Sulphur Feed Stocks
Chemical Projects
Scale Up
Approach Second
Managing
Engineering,
Procurement,
Construction, and
Commissioning
Projects
Software tools are a
great aid to process
engineers, but too

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Edition

much dependence on such tools can often lead to inappropriate and suboptimal designs.

Reliance on software is also a hindrance without a firm

understanding of the principles underlying its operation, since

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users are still
Design Project A
responsible for

devising the design.

In Process Second

Engineering and

Design Using Visual

Basic, Arun K. Datta

provides a unique

and versatile suite

of programs along

with simultaneous

development of the

underlying

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concepts,
principles, and
mathematics. Each
chapter details the
theory and

techniques that
provide the basis
for design and
engineering
software and then
showcases the
development and
utility of programs

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developed using
the material

outlined in the
chapter. This all-

inclusive guide
works

systematically from
basic mathematics

to fluid mechanics,
separators,

overpressure

protection, and

glycol dehydration,

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providing basic
design guidelines
based on
international codes.

Worked examples
demonstrate the
utility of each
program, while the
author also explains
problems and
limitations
associated with the
simulations. After

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reading this book
you will be able to
immediately put
these programs
into action and
have total
confidence in the
result, regardless of
your level of
experience.

Companion Visual
Basic and Excel files
are available for

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download on under
the "Downloads/Up
dates" tab on this
web page.

This new edition
follows the original
format, which
combines a detailed
case study - the
production of
phthalic anhydride -
with practical
advice and

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Engineering

comprehensive
background

Design Project A

Case Study

information.

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Editor

Guiding the reader
through all major

aspects of a

chemical

engineering design,

the text includes

both the initial

technical and

economic feasibility

study as well as the

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detailed design stages. Each aspect of the design is illustrated with material from an award-winning student design project. The book embodies the "learning by doing" approach to design. The student is directed to

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appropriate information sources and is encouraged to make decisions at each stage of the design process rather than simply following a design method.

Thoroughly revised, updated, and expanded, the accompanying text

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includes
developments in
important areas
and many new
references.

This illustrative
reference presents
a systematic
approach to solving
design problems by
listing the needed
equations,
calculating degrees-

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of-freedom,
developing
calculation
procedures to
generate process
specifications, and
sizing equipment.
Containing over
thirty detailed
examples of
calculation
procedures, the
book tabulates

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numerous easy-to-follow calculation procedures as well as the relationships needed for sizing commonly used equipment.

"Chemical Process Engineering" emphasizes the evaluation and selection of equipment by

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considering its
mechanical design
and encouraging
the selection of
standard-size
equipment offered
by manufacturers
to lower costs.

The field of
chemical
engineering is
undergoing a
global

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“renaissance,”
with new processes,
equipment, and
sources changing
literally every day. It
is a dynamic,
important area of
study and the basis
for some of the
most lucrative and
integral fields of
science.

Introduction to

Page 243/264

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Chemical Engineering offers a comprehensive overview of the concept, principles and applications of chemical engineering. It explains the distinct chemical engineering knowledge which gave rise to a

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general-purpose
technology and
broadest
engineering field.
The book serves as
a conduit between
college education
and the real-world
chemical
engineering
practice. It answers
many questions
students and young

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engineers often ask
which include: How
is what I studied in
the classroom
being applied in the
industrial setting?
What steps do I
need to take to
become a
professional
chemical engineer?
What are the career
diversities in

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chemical
engineering and
the engineering
knowledge
required? How is
chemical
engineering design
done in real-world?
What are the
chemical
engineering
computer tools and
their applications?

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What are the prospects, present and future challenges of chemical engineering? And so on. It also provides the information new chemical engineering hires would need to excel and cross the

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critical novice
engineer stage of
their career. It is
expected that this
book will enhance
students
understanding and
performance in the
field and the
development of the
profession
worldwide.

Whether a new-hire

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Engineering

engineer or a
veteran in the field,

this is a must—have

volume for any

chemical

engineer ' s library.

Collaborative and

Distributed

Chemical

Engineering. From

Understanding to

Substantial Design

Process Support

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An Applied Guide
to Process and Plant
Design

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Applied Chemical
Process Design

Chemical Vapour
Deposition

Chemical

Engineering Design

Chemical

Engineering

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students of

chemical

engineering. It

deals with the

application of

chemical

engineering

principles to the

design of chemical

processes and

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Engineering

Design Project A

throughout, the

fourth edition

covers the latest

aspects of process

design, operations,

safety, loss

prevention and

equipment

selection, among

others.

Comprehensive

and detailed, the

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Engineering

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**book is supported
by problems and
selected solutions.**

In addition the

book is widely used

by professionals as

a day-to-day

reference. Best

selling chemical

engineering text

Revised to keep

pace with the

latest chemical

industry changes;

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**designed to see
students through
from**

**undergraduate
study to**

professional

practice End of

chapter exercises

and solutions

There is much

industry guidance

on implementing

engineering

projects and a

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similar amount of guidance on Process Safety Management (PSM). However, there is a gap in transferring the key deliverables from the engineering group to the operations group, where PSM is implemented.

This book provides

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**the engineering
and process safety
deliverables for
each project phase
along with the
impacts to the
project budget,
timeline and the
safety and
operability of the
delivered
equipment.**

**Ground-breaking
text on chemical**

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**product design
covering needs,
ideas, selection,
manufacture.
Sustainability in
the Design,
Synthesis and
Analysis of
Chemical
Engineering
Processes is an
edited collection of
contributions from
leaders in their**

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field. It takes a holistic view of sustainability in chemical and process engineering design, and incorporates economic analysis and human dimensions. Ruiz-Mercado and Cabezas have brought to this

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book their

experience of

researching

sustainable

process design and

life cycle

sustainability

evaluation to assist

with development

in government,

industry and

academia. This

book takes a

practical, step-by-

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chemical

engineering

fundamentals. This

method enables

readers to achieve

new process design

approaches with

high influence and

less complexity. It

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Approach to World

Education

will also help to incorporate sustainability at the early stages of project life, and build up multiple systems level perspectives. Ruiz-Mercado and Cabezas' book is the only book on the market that looks at process sustainability from

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Improve plants,

processes and

products with

sustainability in

mind; from

conceptual design

to life cycle

assessment Avoid

retro fitting costs

by planning for

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sustainability
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concerns at the
Case Study
start of the design
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process Link
Edition
sustainability to
the chemical
engineering
fundamentals