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Nota di contenuto	Cover -- Title Page -- Copyright -- Contents -- Preface -- Nomenclature -- Part I Nonideal Flow Characterization and Chemical Reaction -- Chapter 1 Nonideal Flow and Reactor Characterization -- Summary of Residence Time Distribution Properties and Most Important Models -- Residence Time Distribution -- RTD in Ideal Reactors -- Tanks-in-series (TIS) Model -- Dispersion Model -- Bo&lt -- 0.01 -- Bo&gt -- 0.01, Closed-Closed Recipient -- Bo&gt -- 0.01, Open-Open Recipient -- Chapter 2 Chemical Reaction in Nonideal Reactors -- Summary of Most Important Models -- Calculation of Conversion -- Tanks-in-series (TIS) Model and Chemical Reaction -- Dispersion Model and Chemical Reaction -- From RTD Runs -- Mass Balance in Ideal Reactors -- Arrhenius Law for Kinetic Constants -- Chapter 3 Transfer Function in Chemical Reactor Design -- Summary of the Equations and Concepts -- Transfer Function -- Laplace Transform of Some Functions -- Transfer Function in Ideal Reactors -- CSTR -- PFR -- Part II Convolution and Unsteady State in Chemical Reactors -- Chapter 4 Convolution and Deconvolution of Signals in Chemical Reactor Engineering -- Summary of Equations and Methods -- Convolution -- Deconvolution -- Chapter 5 Partial Differential

Equations in Chemical Reactor Engineering -- Summary -- Finite Differences Method (FDM) -- First Derivative -- Second Derivative -- Stability of the FDM -- Ideal Reactors Working in Unsteady State -- CSTR Working in Unsteady State -- PFR Working in Unsteady State (No Dispersion) -- PFR Working in Dynamic Regime (With Dispersion) -- Part III Catalytic and Multiphase Reactor Design -- Chapter 6 Reaction Rate in Catalytic Processes -- Summary of Equations for the Catalytic Reactor Design -- Rate in Heterogeneous Systems -- Rate of External Diffusion -- Dimensionless Numbers and Their Relationship -- Internal Diffusion Effect.
Combination of Resistances -- Process of Absorption (No Reaction) -- Chapter 7 Catalytic Reactor Design -- Chapter 8 Multiphase Reactor Design -- Summary of Rate Expressions -- Process of Absorption (No Reaction) -- Fluid-Fluid Reaction -- Fluid-Fluid (Gas-Liquid) Reaction in Catalysts -- Part IV Biochemical Reactor Design -- Chapter 9 Biochemical Reactor Design: Enzymatic Processes -- Summary of Kinetic Expressions -- Enzymatic Reactions -- Michaelis-Menten Kinetics -- Chapter 10 Biochemical Reactor Design: Microbial Growth -- Summary of Kinetic Expressions and Mass Balances inBioreactors -- Bibliography -- Index -- EULA.

Sommario/riassunto

This book, authored by Professor Juan A. Conesa, focuses on problem solving in chemical reactor design, offering comprehensive insights into various aspects of chemical reactor engineering. It covers topics such as non-ideal flow, chemical reactions in non-ideal reactors, catalytic and multiphase reactor design, and biochemical reactor design. The book aims to deepen the understanding of chemical reactor design through mathematical modeling and practical examples, supplemented by electronic materials such as spreadsheets and Matlab® programs. It is intended for advanced students and professionals in chemical engineering, providing a valuable resource for both academic study and practical application in industry.