

Chemical Engineering Design and Analysis

Students taking their first chemical engineering course plunge into the “nuts and bolts” of mass and energy balances and often miss the broad view of what chemical engineers do. This innovative text offers a well-paced introduction to chemical engineering. Through a series of real-world examples and extensive exercises, students learn the basic engineering concepts of design and analysis.

The text has two main objectives:

- To have students practice engineering. Students are introduced to the fundamental steps in design and three methods of analysis: mathematical modeling, graphical methods, and dimensional analysis. In addition, students apply engineering skills, such as how to simplify calculations through assumptions and approximations, how to verify calculations, determine significant figures, use spreadsheets, prepare graphs (standard, semilog, and log–log), and use data maps.
- To introduce the chemical engineering profession. Students learn about chemical engineering by designing and analyzing chemical processes and process units to assess product quality, economics, safety, and environmental impact.

This text will help undergraduate chemical engineering students develop engineering skills early in their studies and encourage an informed decision about whether to pursue this profession. Students in related fields such as chemistry, biology, materials science, and mechanical engineering can use this book to learn the underlying principles of chemical processes and their far-reaching applications.

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An Introduction

T. Michael Duncan and Jeffrey A. Reimer

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To my son, Maxwell

T. Michael Duncan

To Karen, Jennifer, Jonathan, Charlotte, and Martin

Jeffrey A. Reimer

