

Michael L. Shuler/Fikret Kargi

Bioprocess Engineering

Basic Concepts

Second Edition

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Preface to the
Second Edition

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In the decade since the first edition of *Bioprocess Engineering: Principles and Applications*, biotechnology has undergone several revolutions. Currently, the ability to sequence the genomes of whole organisms presents opportunities that could be hardly envisioned ten years ago. Many other technological advances have occurred that involve bioprocess engineers with new tools to serve society better. However, the principles of bioprocess engineering stated in the first edition remain sound.

The goals of this revision are twofold. We want to capture for students the excitement created by these advances in biology and microbiology. We want to inform students about these tools. Most importantly, we want to demonstrate how the principles of bioprocess engineering can be applied in concert with these advances.

This edition contains a new section in the first chapter alerting students to the regulatory issues that constrain bioprocess design and modification. We believe students need to be aware of these industrially critical issues. Part 2, "An Overview of Biological Basics," has been updated throughout and expanded. Greater emphasis is given now to posttranslational processing of proteins, as this is a key theme in choice of bioprocessing strategies to make therapeutic products. Basic processes in animal cells are more completely described, since animal cell culture is now an established commercial bioprocess technology. Chapter 5 is made more complete by introduction of a section on noncarbohydrate metabolism. Key concepts in functional genomics have been added to prepare students to understand the impact of these emerging ideas and technologies on bioprocesses.