

This bestselling textbook will introduce undergraduate bioengineering students to the fundamental concepts and techniques, with the basic theme of integrative bioengineering. It covers bioengineering of several body systems, organs, tissues, and cells, integrating physiology at these levels with engineering concepts and approaches; novel developments in tissue engineering, regenerative medicine, nanoscience and nanotechnology; state-of-the-art knowledge in systems biology and bioinformatics; and socio-economic aspects of bioengineering.

One of the distinctive features of the book is that it is integrative in nature (integration of biology, medicine and engineering, across different levels of the biological hierarchy, and basic knowledge with applications). It is unique in that it covers fundamental aspects of bioengineering, cutting-edge frontiers, and practical applications, as well as perspectives of bioengineering development. Furthermore, it covers important socio-economical aspects of bioengineering such as ethics and entrepreneurship.



AN INTRODUCTORY TEXT TO BIOENGINEERING

Key Features

- Organized and edited in a cohesive manner, with extensive use of diagrams and graphics.
- Edited by nationally and internationally renowned bioengineering scientists, two of which are members of all three National Academies (National Academy of Sciences, National Academy of Engineering and Institute of Medicine). There are only nine such scientists in the whole world, and only four of these are still conducting active research.
- Authored by very distinguished experts, including other members of the National Academies and past or present Presidents of the Biomedical Engineering Society. No book in any field has such a collection of accomplished authors.

The cover illustrates our integrative approach, with drawings in the perimeter showing levels of biological hierarchy. The human body shows the major organ-systems discussed in the book. The left knee shows an implant with telemetry. The finite-element grids and the QLV equation exemplify engineering analysis. The background is a gene module network (courtesy of Keiichi Ono and Trey Ideker of UCSD).

Cover illustration composed with Cesar L. Flores of the Shirley Center.

World Scientific

www.worldscientific.com

6503 sc

ISBN-13 978-981-270-794-9 (pbk)
ISBN-10 961-270-794-8 (pbk)



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