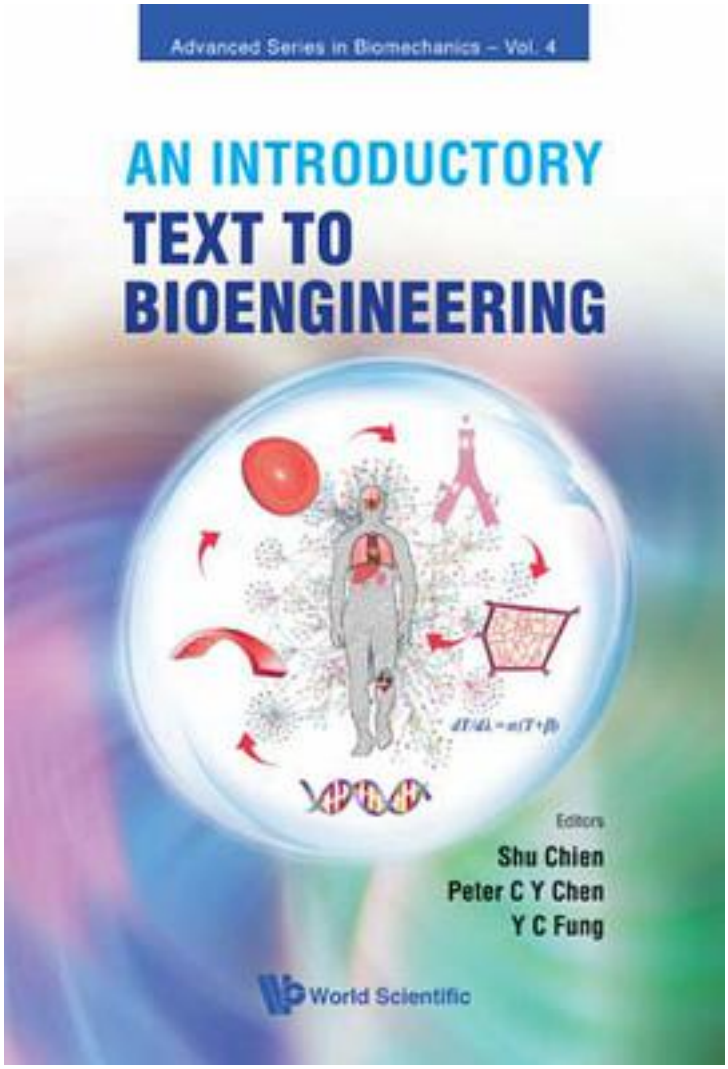
An Introductory Text to Bioengineering



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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 entrepreneurism.

Contents:Perspectives of Biomechanics (Y-C B Fung & W Huang); Cardiac Electromechanics in the Healthy Heart (R C P Kerckhoffs & A D McCulloch); Cardiac Biomechanics and Disease (J H Omens); Bioengineering Solution for the Treatment of Heart Failure (J T Watson & S Chien); Molecular Basis of Modulation of Vascular Functions by Mechanical Forces (S Chien); Autoregulation of Blood Flow: Examining the Process of Scientific Discovery (P C Johnson); Molecular Basis of Cell and Membrane Mechanics (L A Sung); Cell Activation in the Circulation: The Auto-Digestion Hypothesis (G W Schmid-SchÃ ¶ nbein); Blood Substitutes and the Design of Oxygen Non-Carrying and Carrying Fluids (M Intaglietta); Analysis of Human Pulmonary Circulation: A Bioengineering Approach (W Huang et al.); Pulmonary Gas Exchange (P D Wagner); Engineering Approaches to Understanding the Kidney (S C Thomson); Skeletal Muscle Tissue Bioengineering (R L Lieber & S R Ward); Multi-Scale Biomechanics of Articular Cartilage (W C Bae & R L Sah); Design and Development of an In Vivo Force-Sensing Knee Prosthesis (D D D Lima & P C Y Chen); The Implantable Glucose Sensor in Diabetes: A Bioengineering Case Study (D A Gough); Stem Cells in Regenerative Medicine (S Chien & L S B Goldstein); Engineering Compounds Targeted to Vascular Zip Codes (E Ruoslahti); The Structure of the Central Nervous System and Nanoengineering Approaches for Studying and Repairing It (G A Silva); Cellular Biophotonics: Laser Scissors (Ablation) (M W Berns); Microelectronic Arrays: Applications from DNA Hybridization Diagnostics to Directed Self-Assembly Nanofabrication (M J Heller & D Dehlinger); Systems Biology: A Four-Step Process (J L Reed & B O Palsson); Bioinformatics and Systems Biology: Obtaining the Design Principles of Living Systems (S Subramaniam); Synthetic Biology: Bioengineering at the Genomic Level (N Ostroff et al.); Network Genomics (T Ideker); Genomes, Genomic Technologies and Medicine (X Huang); Ethics for Bioengineers (M Kalichman); Opportunities and Challenges in Bioengineering Entrepreneurship (J-S Lee); How to Move Medical Devices from Bench to Bedside (P Citron).

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