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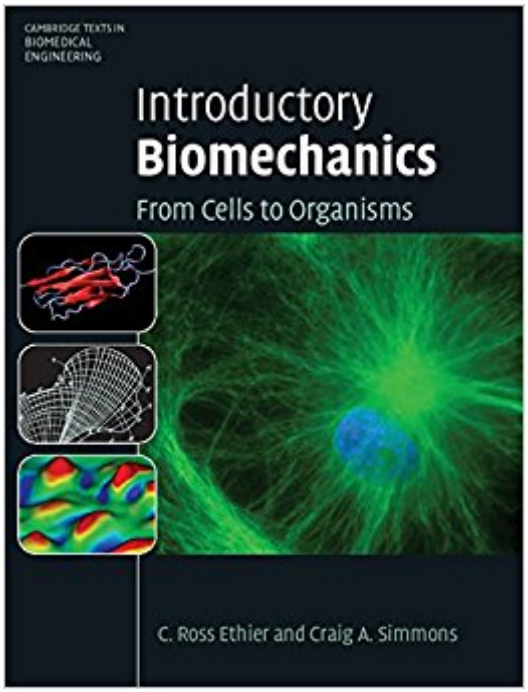
Introductory Biomechanics: From Cells To Organisms (Cambridge Texts In Biomedical Engineering)



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Synopsis

Introductory Biomechanics is a new, integrated text written specifically for engineering students. It provides a broad overview of this important branch of the rapidly growing field of bioengineering. A wide selection of topics is presented, ranging from the mechanics of single cells to the dynamics of human movement. No prior biological knowledge is assumed and in each chapter, the relevant anatomy and physiology are first described. The biological system is then analyzed from a mechanical viewpoint by reducing it to its essential elements, using the laws of mechanics and then tying mechanical insights back to biological function. This integrated approach provides students with a deeper understanding of both the mechanics and the biology than from qualitative study alone. The text is supported by a wealth of illustrations, tables and examples, a large selection of suitable problems and hundreds of current references, making it an essential textbook for any biomechanics course. C. Ross Ethier is a professor of Mechanical and Industrial Engineering, the Canada Research Chair in Computational Mechanics, and the Director of the Institute of Biomaterials and Biomedical Engineering at the University of Toronto, with cross-appointment to the Department of Ophthalmology & Vision Sciences. His research focuses on biomechanical factors in glaucoma and blood flow and mass transfer in the large arteries. He has taught biomechanics for over ten years. Craig A. Simmons is the Canada Research Chair in Mechanobiology and an assistant professor of Mechanical and Industrial Engineering at the University of Toronto, with cross-appointments to the Institute of Biomaterials and Biomedical Engineering and the Faculty of Dentistry. His research interests include cell and tissue biomechanics and cell mechanobiology, particularly as it relates to tissue engineering and heart valve disease.

Book Information

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Customer Reviews

Ethier and Simmons have crafted a masterful book clearly capable of introducing engineering students of multiple disciplines to the fascinating field of biomechanics. This text should find wide application in providing sufficient background for a fundamental understanding of this important, emerging area. The depth of coverage will serve well as a foundation for further investigation at the upper undergraduate or graduate level. Yet, little prior knowledge of biology is assumed. The topics covered include clinical specialties in which biomechanics has lent to the understanding and improvement of human health, including the cardiovascular, optometry, and musculoskeletal areas. Based on a long-standing course taught to non-bioengineers, the presentation of material is clear and straightforward. Illustrations are of excellent quality and rich in content. This text will inspire many students of traditional engineering areas to think of biomechanics as a fertile discipline worthy of further pursuit. - James E. Moore, Professor of Biomedical Engineering, Texas A&M University

This text introduces students to a wide selection of topics in biomechanics, ranging from the mechanics of single cells to the dynamics of human movement. The text adopts an integrated approach and is supported by a wealth of illustrations and problems, making it an essential textbook for any biomechanics course.

Very nice book, in decent shape.

Book gives bare minimum examples and expects students to be able to solve much more difficult end of chapter problems with little background knowledge.

As a neophyte to the field, this book is proving incredibly interesting. The writing is not too technical as to slog down reading progress. Instead, difficult concepts are explained in a way that reveals a talent to teach, explain, and inform.

I was required to get this book for school!

I needed a very basic introduction to biomechanics that covers not only topics on the macroscopic behavior of biological tissues but also the microstructure of tissues. This book does a very good job in building the multi-scaling structure of tissues. Very pleased!

I bought this book because it had significant discounts here on and, from various previews, seemed to cover the material that my biomechanics course covered. My class uses a biomechanics book by YC Fung, but that book is far too dense and unclear; Fung often dives into topics without establishing clear reasons why.This book is well made. It covers many of the same topics that Fung covers in his book, but without the ambiguous mathematical explanations Fung uses. The math that is used here is clearly explained and justified. It goes into the level of depth that is appropriate for an undergraduate without much background in biology. Overall, it's a great book that hopefully becomes a primary textbook for biomechanics classes, and it makes a great, cheap (at least for now) supplement to any biomechanics course, especially if your course uses a YC Fung book.

Interesting book, for my dog and me. Unfortunately, for me it was the subject matter, my dog for some reason had an obsession with this book. I dont know if it is the smell or what, but he loved attacking it (not a problem with any other book).The material itself is neat, sometimes a little hard to understand with how they phrase it, but worth a read if you like mechanics and want to see how the body works in a mechanical sense. My personal favorite was the blood flow.

This book is okay. All pictures are greyscale. Most equations are not derived, instead other books are referenced instead.

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