

Basic Biomechanics

SUSAN J. HALL



THIRD EDITION

B a s i c B i o m e c h a n i c s

T H I R D E D I T I O N

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BASIC BIOMECHANICS, THIRD EDITION

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Preface

The third edition of *Basic Biomechanics* constitutes a significant update of the previous edition. As the interdisciplinary field of biomechanics grows in both breadth and depth, it is important that even introductory textbooks reflect the nature of the science. Accordingly, the text material has been revised, expanded, and updated, with the objectives being to present relevant information from recent research findings as well as to prepare students to *analyze* human biomechanics.

The approach taken remains an integrated balance of qualitative and quantitative examples, applications, and problems designed to illustrate the principles discussed. The third edition also maintains the important sensitivity to the fact that some beginning students of biomechanics possess weak backgrounds in mathematics and includes numerous sample problems and applications along with practical advice on approaching quantitative problems.

ORGANIZATION

The new edition incorporates minor organizational changes within several of the chapters to address the revision and expansion of material from the previous edition. Students will still find that each chapter follows a logical and readable format, with the introduction of new concepts consistently accompanied by practical human movement examples and applications from across the lifespan and across sport, ergonomic, and daily living activities.

NEW CONTENT HIGHLIGHTS

New content has been added to provide updated scientific information on relevant topics. *All chapters* contain recently documented examples of the concepts presented from the scientific literature accompanied by *new, improved illustrations*. The chapters on the biomechanics of human bone and muscle, in particular, have been significantly revised and expanded to reflect recent scientific developments in these topical areas. The introductory chapter and chapters on the upper and lower extremities and the spine also contain additional, updated coverage.

Balanced Coverage

The Biomechanics Academy of AAHPERD recommends that preparation for undergraduate students in the area of biomechanics be devoted approximately one-third to anatomical considerations, approximately one-third to mechanical considerations, and the remainder to applications. The integrated approach to coverage of these areas taken in the previous editions of the book is continued in this third edition.

Applications Oriented

All chapters in this new edition contain discussion of a broad range of updated human movement applications, many of which are taken from the recent biomechanics research literature. Special emphasis has been placed on the inclusion of examples that span all ages and address clinical and daily living issues, as well as sport applications.

The Use of Problems

The Introductory and Additional Problems sections have been revised, with greater emphasis on critical thinking added. The sample problems with solutions provided throughout the text have also been expanded.

Laboratory Exercises

The section on suggested laboratory experiences has also been revised, with more practical suggestions for a variety of laboratory situations included. While many of the exercises can be used “as is,” students and instructors are also encouraged to view these suggestions as seed concepts that can be modified and expanded.

Related Web Sites

A new section on related web sites has been added at the end of each chapter. The sections provide selected links to the wealth of related scientific and medical information now available on the World Wide Web.

PEDAGOGICAL FEATURES

Aside from the sample problems, problem sets, and laboratory experiences, and web sites, the book retains other pedagogical features from previous editions. These include **chapter objectives**, which serve as focal points for understanding chapter content; **marginal definitions and notes**, which highlight important terms and concepts; **chapter sum-**

maries; suggested readings, for enrichment beyond the material presented in each chapter; a comprehensive **glossary**; and several **appendices**, containing useful reference or review information. Newly added to the third edition are numerous revised and updated illustrations, in a two-color format for superior clarity.

ANCILLARY

A new Instructor's Manual to accompany the book has been developed by Darla Smith, University of Texas at El Paso. The new Instructor's Manual provides updated pedagogical materials, problem solutions, and a bank of test questions corresponding to each chapter. Also included are 100 overhead transparencies displaying selected illustrations and sample problems.

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