

# Book Reviews

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## INTERMEDIATE PHYSICS FOR MEDICINE AND BIOLOGY. 2nd. Ed.

R.K. Hobbie. New York, John Wiley & Sons, 1988, 623 pp, \$54.60

Ten years ago, I had the pleasure of reading from cover to cover the first edition of this text and writing a review for the *Journal of Nuclear Medicine*. Then, as now, I found the title accurately summarized the content of this excellent college senior or graduate level physics text. Most medical physicists are associated with radiation physics and tend to forget the wide spectrum of biophysics topics that don't encompass ionizing radiation, yet can only be accurately described by fundamental physics principles. This book covers in substantial depth the basis for many concepts and procedures in medicine and biology from the standpoint of fundamental physics principles.

The author clearly states in the preface that he makes no apology for the use of calculus throughout the text and that this is not an introductory physics text. It is based on his teaching of an intermediate physics course for seniors and graduate students in physics, physiology, microbiology, and biomedical engineering. This edition follows the format of the first edition by beginning each chapter with a summary of the content of each section in the chapter and an explanation for its inclusion. There are 17 chapters, five more than the first edition, covering the following topics: Mechanics, Exponential Growth and Decay, Systems of Many Particles, Transport in an Infinite Medium, Transport Through Neutral Membranes, Electrical Properties of Nerves, Exterior Cellular Potential and the Electrocardiogram, Charged Membranes, Biomagnetism, Feedback and Control, Least Squares and Signal Analysis, Image Reconstruction, Atoms and Light, Interaction of Photons and Charged Particles with Matter, Medical X-Rays, Nuclear Physics and Nuclear Medicine, and Magnetic Resonance Imaging. In addition there are 17 appendices including two inside the front cover on fundamental constants and conversion from older units to SI units.

An interesting expansion in this edition is the listing of several computer programs that the student is encouraged to copy and run for a better understanding of the principle being demonstrated. Since the first edition a decade ago, computers have become much more available and the author has included computer simulations both in the text and in the problems at the end of each chapter.

This book is not appropriate as the primary text in nuclear medicine physics or radiological physics for medical physics training of scientists or physicians in Radiology or Nuclear Medicine since these topics comprise a small segment of the book. However, it is an excellent reference for a much broader coverage of physics in the biomedical sciences. There are very few typographical errors and the quality of the printing and illustrations is first class.

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## ANATOMY AND MRI OF THE JOINTS: A MULTIPLANAR ATLAS.

W.D. Middleton, T.L. Lawson, Ed., New York, Raven Press, 1989, 301 pp, \$125.00

This book is an atlas of normal multiplanar joint anatomy, and includes both magnetic resonance (MR) images and color cadaveric cryomicrosections. Spin echo MR images of normal volunteers were obtained using a 1.5 Tesla system and commercially available surface coils. Slice thickness and field-of-view varied according to joint size. Cryomicrotome cadaver sections were obtained in planes corresponding to the MR images.

Chapters are organized according to individual joints, and include the temporomandibular joint, shoulder, elbow, wrist, finger, vertebral column, hip, knee, and ankle. Each chapter begins with a brief text describing basic anatomy of that joint. Line drawings of significant structures assist in three dimensional orientation. This is followed by cadaver sections and MR images, usually in all three orthogonal planes. Oblique planes are not included. For both MR images and cadaveric sections, anatomic structures are identified by a small dot, with lines connecting the structure to the appropriate label outside of the image. This method of labeling prevents cluttering of the images. For each MR image or cadaver section, spatial orientation and slice location are indicated at the top of the page with line drawings. Both MR images and cadaver photographs are of high quality, and clearly demonstrate all significant anatomy.

As an anatomy text, this book would serve as a valuable reference for both students studying musculoskeletal anatomy and professionals involved in cross-sectional image acquisition, especially magnetic resonance imaging and computed tomography. While the omission of oblique sections which are commonly used for the shoulder and spine is a minor drawback, this atlas is indeed a timely publication.

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## NUCLEAR ANALYTICAL TECHNIQUES IN MEDICINE.

R. Cesareo, Ed. Elsevier, Amsterdam, New York, 1988, 400 pp, \$129.00

This is Volume 8 in the series "Techniques and Instrumentation in Analytical Chemistry". It consists of seven chapters, the first being a summary of "Trace Element Analysis in Biological Samples," by H.J.M. Bowen of Reading University, England, that gives some interesting data on normal and abnormal values in tissues. The second chapter, by R. Cesareo of Rome, Italy, is entitled "Photon Induced X-ray Emission", and discusses the theory and practice of the technique in great detail. This is followed by a chapter on "Particle Induced X-ray Emission", by B. Gonsior, of Bochum, West Germany,

Intermediate physics for medicine and biology. RK Hobbie, BJ Roth. Springer Science & Business Media, 2007. 474. 2007. Physics with illustrative examples from medicine and biology: mechanics. GB Benedek, FMH Villars. Springer Science & Business Media, 2000. 172\*. 2000. Functional identification of perceptual and response biases in choice reaction time. D LaBerge, R Legrand, RK Hobbie. Journal of Experimental Psychology 79 (2p1), 295, 1969. 65. 1969. Single-pool exponential decomposition models: potential pitfalls in their use in ecological studies. EC Adair, SE Hobbie, RK Hobbie. Ecolo Intended for advanced undergraduate and beginning graduate students in biophysics, physiology, medical physics, cell biology, and biomedical engineering, this wide-ranging text bridges the gap between introductory physics and its application to the life and biomedical sciences. This extensively revised and updated fourth edition reflects new developments at the burgeoning interface between physics and biomedicine. Among the many topics treated are: forces in the skeletal system; fluid flow, with examples from the circulatory