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Diagnostic Radiology Physics Elsevier Health Sciences

Designed to prepare candidates for the American Board of Health Physics Comprehensive examination (Part I) and other certification examinations, this monograph introduces professionals in the field to radiation protection principles and their practical application in routine and emergency situations. It features more than 650 worked examples illustrating concepts under discussion along with in-depth coverage of sources of radiation, standards and regulations, biological effects of ionizing radiation, instrumentation, external and internal dosimetry, counting statistics, monitoring and interpretations, operational health physics, transportation and waste, nuclear emergencies, and more. Reflecting for the first time the true scope of health physics at an introductory level, Basic Health Physics: Problems and Solutions gives readers the tools to properly evaluate challenging situations in all areas of radiation protection, including the medical, university, power reactor, fuel cycle, research reactor, environmental, non-ionizing radiation, and accelerator health physics.

Webb's Physics of Medical Imaging, Second Edition
Academic Publishers

MRI from Picture to Proton presents the basics of MR practice and theory in a unique way: backwards! The subject is approached just as a new MR practitioner would encounter MRI: starting from the images, equipment and scanning protocols, rather than pages of physics theory. The reader is brought face-to-face with issues pertinent to practice immediately, filling in the theoretical background as their experience of scanning grows. Key ideas are introduced in an intuitive manner

which is faithful to the underlying physics but avoids the need for difficult or distracting mathematics. Additional explanations for the more technically inquisitive are given in optional secondary text boxes. The new edition is fully up-dated to reflect the most recent advances, and includes a new chapter on parallel imaging. Informal in style and informed in content, written by recognized effective communicators of MR, this is an essential text for the student of MR.

Introduction to Radiological Physics and Radiation Dosimetry Prentice Hall

Fundamental Physics of Radiology, Third Edition provides a general introduction to the methods involving radioactive isotopes and ultrasonic radiations. This book provides the fundamental principles upon which the clinical uses of radioactive isotopes and ultrasonic radiation depend. Organized into four sections encompassing 45 chapters, this edition begins with an overview of the basic facts about matter and energy. This text then examines the technical details of some practical X-ray tubes. Other chapters consider the action of the X-rays on the screen to produce an emission of visible light photons in amount proportional to the incident X-ray intensity. This book discusses as well the fundamental aspects of the physical principles of radiotherapy, in which most attention is being given to gamma- and X-rays. The final chapter deals with the provision of adequate barriers and protective devices to guarantee the safety of the workers concerned. This book is a valuable resource for radiologists, physicists, and scientists.

Radiation Protection in Nuclear Medicine Springer Science & Business Media

A straightforward presentation of the broad concepts underlying radiological physics and radiation dosimetry for the graduate-level

student. Covers photon and neutron attenuation, radiation and charged particle equilibrium, interactions of photons and charged particles with matter, radiotherapy dosimetry, as well as photographic, calorimetric, chemical, and thermoluminescence dosimetry. Includes many new derivations, such as Kramers X-ray spectrum, as well as topics that have not been thoroughly analyzed in other texts, such as broad-beam attenuation and geometrics, and the reciprocity theorem. Subjects are laid out in a logical sequence, making the topics easier for students to follow. Supplemented with numerous diagrams and tables.

MRI from Picture to Proton Taylor & Francis

An up-to-date edition of the authoritative text on the physics of medical imaging, written in an accessible format The extensively revised fifth edition of Hendee's Medical Imaging Physics, offers a guide to the principles, technologies, and procedures of medical imaging. Comprehensive in scope, the text contains coverage of all aspects of image formation in modern medical imaging modalities including radiography, fluoroscopy, computed tomography, nuclear imaging, magnetic resonance imaging, and ultrasound. Since the publication of the fourth edition, there have been major advances in the techniques and instrumentation used in the ever-changing field of medical imaging. The fifth edition offers a comprehensive reflection of these advances including digital projection imaging techniques, nuclear imaging technologies, new CT and MR imaging methods, and ultrasound applications. The new edition also takes a radical strategy in organization of the content, offering the fundamentals common to most imaging methods in Part I of the book, and application of those fundamentals in specific imaging modalities in Part II. These fundamentals also include notable updates and new content including radiobiology, anatomy and physiology relevant to medical imaging, imaging science, image processing, image display, and information

technologies. The book makes an attempt to make complex content in accessible format with limited mathematical formulation. The book is aimed to be accessible by most professionals with lay readers interested in the subject. The book is also designed to be of utility for imaging physicians and residents, medical physics students, and medical physicists and radiologic technologists perpetrating for certification examinations. The revised fifth edition of Hendee's Medical Imaging Physics continues to offer the essential information and insights needed to understand the principles, the technologies, and procedures used in medical imaging.

Physics in Medical Diagnosis Lippincott Williams & Wilkins
Widely regarded as the cornerstone text in the field, the successful series of editions continues to follow the tradition of a clear and comprehensive presentation of the physical principles and operational aspects of medical imaging. The **Essential Physics of Medical Imaging**, 4th Edition, is a coherent and thorough compendium of the fundamental principles of the physics, radiation protection, and radiation biology that underlie the practice and profession of medical imaging. Distinguished scientists and educators from the University of California, Davis, provide up-to-date, readable information on the production, characteristics, and interactions of non-ionizing and ionizing radiation, magnetic fields and ultrasound used in medical imaging and the imaging modalities in which they are used, including radiography, mammography, fluoroscopy, computed tomography, magnetic resonance, ultrasound, and nuclear medicine. This vibrant, full-color text is enhanced by more than 1,000 images, charts, and graphs, including hundreds of new illustrations. This text is a must-have resource for medical imaging professionals, radiology residents who are preparing for Core Exams, and teachers and students in medical physics and biomedical engineering.

Physics, Engineering and Clinical Applications CRC Press

Since the publication of the best-selling, highly acclaimed first edition, the technology and clinical applications of medical imaging have changed significantly. Gathering these developments into one volume, Webb's **Physics of Medical Imaging**, Second Edition presents a thorough update of the basic physics, modern technology and many examples of clinical application across all the modalities of medical imaging. New to the Second Edition Extensive updates to all original chapters Coverage of state-of-the-art detector technology and computer processing used in medical imaging 11 new

contributors in addition to the original team of authors Two new chapters on medical image processing and multimodality imaging More than 50 percent new examples and over 80 percent new figures Glossary of abbreviations, color insert and contents lists at the beginning of each chapter Keeping the material accessible to graduate students, this well-illustrated book reviews the basic physics underpinning imaging in medicine. It covers the major techniques of x-radiology, computerised tomography, nuclear medicine, ultrasound and magnetic resonance imaging, in addition to infrared, electrical impedance and optical imaging. The text also describes the mathematics of medical imaging, image processing, image perception, computational requirements and multimodality imaging.

Linear Accelerators for Radiation Therapy CRC Press

This book summarizes basic knowledge of atomic, nuclear, and radiation physics that professionals need for efficient and safe use of ionizing radiation. Concentrating on the underlying principles of radiation physics, it covers prerequisite knowledge for medical physics courses on the graduate and post-graduate levels, providing the link between elementary physics on the one hand and the intricacies of the medical physics specialties on the other.

Introduction to Medical Imaging John Wiley & Sons

In the development of many medical technologies the beginning is characterised by an emphasis on the basic scientific principles of the technology and the optimisation of the functional aspects of the technology. As a technology matures there is a tendency for the underlying principles to be forgotten as the clinical applications begin to develop and the focus moves to an understanding of the clinical application. This maturity brings with it new challenges for those involved in the use of the technology. An acceptance of the methodology may lead to a scaling back of the basic training of staff into the fundamentals of the techniques and lead to a lack of questioning as to those issues which lead to the optimisation in clinical applications. This lack of basic training may ultimately lead to a stifling of research and development of the technology as a whole as trained staff becomes a scarce commodity. Nuclear medicine is no exception to this development cycle. As a medical specialty the discipline has matured. The basic imaging technology has become more reliable in everyday use requiring less input from scientific staff. Clinical procedures have become protocols which are often followed without due understanding of the basic principles underlying the imaging procedure. This is clearly demonstrated when new radiopharmaceuticals are introduced into the market place.

Khan's The Physics of Radiation Therapy Butterworth-Heinemann
Since its first edition in 1980, **Essential Physics for Radiographers** has earned an international reputation as a clear and straightforward introduction to the physics of radiography. Now in its fourth edition, this book remains a core textbook for student radiographers. The authors have retained the pragmatic approach of earlier editions and

continue to target the book particularly at those students who find physics a difficult subject to grasp. The fourth edition builds on the major revisions introduced in the third edition. The content has been updated to reflect recent advances in imaging technology. The chapter on Radiation Safety has been completely rewritten in the light of the latest changes in relevant legislation, and a re-examination of the physical principles underpinning magnetic resonance imaging forms the basis of a new chapter. Worked examples and calculations again feature strongly, and the innovative and popular Maths Help File, guides readers gently through the mathematical steps and concepts involved. The reference citations have been updated and now include Internet sources.

An Introduction to Radiation Protection in Medicine John Wiley & Sons

Written by the chief physicist at Johns Hopkins University Hospital, this easy-to-read short textbook explains the physics behind multi-detector CT technology, particularly newer, more complex technology. The focus is on principles of physics, effects of scan parameters on image quality, and optimum radiation dosage. The book includes numerous key points summaries and questions to assist in exam preparation.

A Physics Perspective CRC Press

Covering the basics of X-rays, CT, PET, nuclear medicine, ultrasound, and MRI, this textbook provides senior undergraduate and beginning graduate students with a broad introduction to medical imaging. Over 130 end-of-chapter exercises are included, in addition to solved example problems, which enable students to master the theory as well as providing them with the tools needed to solve more difficult problems. The basic theory, instrumentation and state-of-the-art techniques and applications are covered, bringing students immediately up-to-date with recent developments, such as combined computed tomography/positron emission tomography, multi-slice CT, four-dimensional ultrasound, and parallel imaging MR technology. Clinical examples provide practical applications of physics and engineering knowledge to medicine. Finally, helpful references to specialised texts, recent review articles, and relevant scientific journals are provided at the end of each chapter, making this an ideal textbook for a one-semester course in medical imaging.

Physics in Nuclear Medicine Lippincott Williams & Wilkins

Linear Accelerators for Radiation Therapy, Second Edition focuses on the fundamentals of accelerator systems, explaining the underlying physics and the different features of these systems. This edition includes expanded sections on the treatment head, on x-ray production via multileaf and dynamic collimation for the production of wedged and other i
The Physics of Radiation Therapy Cambridge University Press

Proton Therapy Physics goes beyond current books on proton therapy to provide an in-depth overview of the physics aspects of this radiation therapy modality, eliminating the need to dig through information scattered in the medical physics literature. After tracing the history of proton therapy, the book summarizes the atomic and nuclear physics background necessary for understanding proton interactions with tissue. It describes the physics of proton accelerators, the parameters of clinical proton beams, and the mechanisms to generate a conformal dose distribution in a patient. The text then covers detector systems and measuring techniques for reference dosimetry, outlines basic quality assurance and commissioning guidelines, and gives examples of Monte Carlo simulations in proton therapy. The book moves on to discussions of treatment planning for single- and multiple-field uniform doses, dose calculation concepts and algorithms, and precision and uncertainties for nonmoving and moving targets. It also examines computerized treatment plan optimization, methods for in vivo dose or beam range verification, the safety of patients and operating personnel, and the biological implications of using protons from a physics perspective. The final chapter illustrates the use of risk models for common tissue complications in treatment optimization. Along with exploring quality assurance issues and biological considerations, this practical guide collects the latest clinical studies on the use of protons in treatment planning and radiation monitoring. Suitable for both newcomers in medical physics and more seasoned specialists in radiation oncology, the book helps readers understand the uncertainties and limitations of precisely shaped dose distribution.

The Physics of Diagnostic Imaging Second Edition Springer Science & Business Media

The second edition of this easy-to-understand pocket guide remains an invaluable tool for students, assistant practitioners and radiographers. Providing an accessible introduction to the subject in a reader-friendly format, it includes diagrams and photographs to support the text. Each chapter provides clear learning objectives and a series of MCQs to test reader assimilation of the material. The book opens with overviews of image production, basic mathematics and imaging physics, followed by detailed chapters on the physics relevant to producing diagnostic images using X-rays and digital technologies. The content has been updated throughout and includes a new chapter on CT imaging and additional material on radioactivity, dosimetry, and imaging display and manipulation.

Clark ' s Essential Physics in Imaging for Radiographers supports students in demonstrating an understanding of the fundamental definitions of physics applied to radiography ... all you need to know to pass your exams!

The Essential Physics of Medical Imaging John Wiley & Sons Part of the renowned The Basics series, Nuclear Medicine Physics helps build foundational knowledge of how and why things happen in the clinical environment. Ideal for board review and reference, the 8th edition provides a practical summary of this complex field, focusing on essential details as well as real-life examples taken from nuclear medicine practice. New full-color illustrations, concise text, essential mathematical equations, key points, review questions, and useful appendices help you quickly master challenging concepts in nuclear medicine physics.

Radiation Physics for Medical Physicists John Wiley & Sons Developed from the authors' highly successful annual imaging physics review course, this new Second Edition gives readers a clear, fundamental understanding of the theory and applications of physics in radiology, nuclear medicine, and radiobiology. The Essential Physics of Medical Imaging, Second Edition provides key coverage of the clinical implications of technical principles--making this book great for board review. Highlights of this new edition include completely updated and expanded chapters and more than 960 illustrations. Major sections cover basic concepts, diagnostic radiology, nuclear medicine, and radiation protection, dosimetry, and biology. A Brandon-Hill recommended title.

Basic Physics and Technology of Medical Diagnostic Ultrasound Lippincott Williams & Wilkins

Physics in Nuclear Medicine - by Drs. Simon R. Cherry, James A. Sorenson, and Michael E. Phelps - provides current, comprehensive guidance on the physics underlying modern nuclear medicine and imaging using radioactively labeled tracers. This revised and updated fourth edition features a new full-color layout, as well as the latest information on instrumentation and technology. Stay current on crucial developments in hybrid imaging (PET/CT and SPECT/CT), and small animal imaging, and benefit from the new section on tracer kinetic modeling in neuroreceptor imaging. What's more, you can reinforce your understanding with graphical animations online at www.expertconsult.com, along with the fully searchable text and calculation tools. Master the physics of nuclear medicine with thorough explanations of analytic equations and illustrative graphs to make them accessible. Discover the technologies used in state-of-the-art nuclear medicine imaging systems Fully grasp the process of emission computed tomography with advanced mathematical concepts presented in the appendices. Utilize the extensive data in

the day-to-day practice of nuclear medicine practice and research. Tap into the expertise of Dr. Simon Cherry, who contributes his cutting-edge knowledge in nuclear medicine instrumentation. Stay current on the latest developments in nuclear medicine technology and methods New sections to learn about hybrid imaging (PET/CT and SPECT/CT) and small animal imaging. View graphical animations online at www.expertconsult.com, where you can also access the fully searchable text and calculation tools. Get a better view of images and line art and find information more easily thanks to a brand-new, full-color layout. The perfect reference or textbook to comprehensively review physics principles in nuclear medicine. Nuclear Medicine Physics: The Basics Lippincott Williams & Wilkins This publication is aimed at students and teachers involved in programmes that train medical physicists for work in diagnostic radiology. It provides, in the form of a syllabus, a comprehensive overview of the basic medical physics knowledge required for the practice of modern diagnostic radiology. This makes it particularly useful for graduate students and residents in medical physics programmes. The material presented in the publication has been endorsed by the major international organisations and is the foundation for academic and clinical courses in both diagnostic radiology physics and in emerging areas such as imaging in radiotherapy. The Essential Physics of Medical Imaging International Atomic Energy Agency

This book explains clearly and in detail all aspects of radiation protection in nuclear medicine, including measurement quantities and units, detectors and dosimeters, and radiation biology. Discussion of radiation doses to patients and to embryos, fetuses, and children forms a central part of the book. Phantom models, biokinetic models, calculations, and software solutions are all considered, and a further chapter is devoted to quality assurance and reference levels. Occupational exposure also receives detailed attention. Exposure resulting from the production, labeling, and injection of radiopharmaceuticals and from contact with patients is discussed and shielding calculations are explained. The book closes by considering exposure of the public and summarizing the "rules of thumb" for radiation protection in nuclear medicine. This is an ideal textbook for students and a ready source of useful information for nuclear medicine specialists and medical physics experts.