

# Introduction To Nuclear Engineering

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the third edition of this popular book is updated to include a completely revised discussion of reactor technology an improved discussion of the reactor physics and a more detailed discussion of basic nuclear physics and models introduces the basics of the shell model of the nucleus and a beginning discussion of quantum mechanics discusses both u s and non u s reactor designs as well as advanced reactors provides for a more detailed understanding of both reactor statics and kinetics includes updated information on reactor accidents and safety

nuclear engineering a conceptual introduction to nuclear power provides coverage of the introductory salient principles of nuclear engineering in a comprehensive manner for those entering the profession at the end of their degree the nuclear power industry is undergoing a renaissance because of the

desire for low carbon baseload electricity the growing population and environmental concerns about shale gas so this book is a welcomed addition to the science in addition users will find a great deal of information on the change in the industry along with other topical areas of interest that are uniquely covered intended for undergraduate students or early postgraduate students studying nuclear engineering this new text will also be appealing to scientifically literate non experts wishing to be better informed about the nuclear option presents a succinct and clear explanation of the key facts and concepts on how nuclear engineering power systems function and how their related fuel supply cycles operate provides full coverage of the nuclear fuel cycle including its scientific and historical basis describes a comprehensive range of relevant reactor designs from those that are defunct current and in plan construction for the future including smrs and geniv summarizes all major accidents and their impact on the industry and society

this book highlights a comprehensive and detailed introduction to the fundamental principles related to nuclear engineering as one of the most popular choices of future energy nuclear energy is of increasing demand globally due to the complexity of nuclear engineering its research and development as well as safe operation of its facility requires a wide scope of knowledge ranging from basic disciplines such as mathematics physics chemistry and thermodynamics to applied subjects such as reactor theory and radiation protection the book covers all necessary knowledge in an illustrative and readable style with a sufficient amount of examples and exercises it is an easy to read textbook for graduate students in nuclear engineering and a valuable handbook for nuclear facility operators maintenance personnel and technical staff

introduction to nuclear engineering serves as an accompanying study guide for a complete introductory single semester course in nuclear engineering it is structured for general class use alongside fundamental nuclear physics and engineering textbooks and it is equally suited for individual self study the book begins with basic modern physics with atomic and nuclear models it goes on to cover nuclear energetics radioactivity and decays and binary nuclear reactions and basic fusion exploring basic radiation interactions with matter the book finishes by discussing nuclear reactor physics nuclear fuel cycles and radiation doses and hazard assessment each chapter highlights basic concepts examples problems with answers and a final assessment the book is intended for first year undergraduate and graduate engineering students taking nuclear engineering and nuclear energy courses

nuclear engineering fundamentals is the most modern up to date and reader friendly nuclear engineering textbook on the market today it provides a thoroughly modern alternative to classical nuclear engineering textbooks that have not been updated over the last 20 years printed in full color it conveys a sense of awe and wonder to anyone interested in the field of nuclear energy it discusses nuclear reactor design nuclear fuel cycles reactor thermal hydraulics reactor operation reactor safety radiation detection and protection and the interaction of radiation with matter it presents an in depth introduction to the science of nuclear power nuclear energy production the nuclear chain reaction nuclear cross sections radioactivity and radiation transport all major types of reactors are introduced and discussed and the role of internet tools in their analysis and design is explored reactor safety and reactor containment systems are explored as well to convey the evolution of nuclear science and engineering historical figures and their contributions to

evolution of the nuclear power industry are explored numerous examples are provided throughout the text and are brought to life through life like portraits photographs and colorful illustrations the text follows a well structured pedagogical approach and provides a wide range of student learning features not available in other textbooks including useful equations numerous worked examples and lists of key web resources as a bonus a complete solutions manual and pdf slides of all figures are available to qualified instructors who adopt the text more than any other fundamentals book in a generation it is student friendly and truly impressive in its design and its scope it can be used for a one semester a two semester or a three semester course in the fundamentals of nuclear power it can also serve as a great reference book for practicing nuclear scientists and engineers to date it has achieved the highest overall satisfaction of any mainstream nuclear engineering textbook available on the market today

the third edition of this respected text offers a current and complete introduction to nuclear engineering all units have been revised to reflect current standards in addition to the numerous end of chapter problems computer exercises have been added

nuclear power has in recent years undergone a major transformation resulting in major technical developments and a new generation of nuclear scientists and engineers a comprehensive book that reflects the latest nuclear technologies has been lacking until now the nuclear engineering handbook is a response to this global resurgence of interest in commercial nuclear power a broad overview of nuclear power and engineering and their limitless potential this basic introduction to the field provides an in depth discussion of power plants and extensive coverage of the nuclear fuel cycle waste disposal and related engineering technologies organized into three sections nuclear power reactors nuclear fuel cycle processes and facilities and engineering and analytical applications this book addresses the entire nuclear fuel cycle and process topics include everything from the mining milling and enrichment of uranium and thorium fuel resources to fuel fabrication nuclear materials transportation fuel reprocessing and safe waste disposal this all encompassing volume discusses current analytical techniques related to nuclear engineering addressing safety heat transfer shielding thermo hydraulics and heat physics covering reactor operation and radiation protection it also outlines the economic considerations involved in building new nuclear power stations instead of large fossil fueled plants and elaborates on concerns regarding the control of emissions from the latter a review of past and current nuclear engineering capabilities this valuable resource covers the gamut of crucial topics including historical perspectives a detailed technological review and an assessment of the field s future direction it is an exceptional tool that will help readers to foster optimal understanding and use of nuclear power for electricity generation now and in the future

first published in 1986 this work should be considered as a simple introduction to nuclear engineering it covers and somewhat enlarges upon a set of courses that the author s currently give at the ecole polytechnique federale of lausanne switzerland

nuclear engineering plays an important role in various industrial health care and energy processes modern physics has generated its fundamental

principles a growing number of students and practicing engineers need updated material to access the technical language and content of nuclear principles nuclear principles in engineering second edition is written for students engineers physicians and scientists who need up to date information in basic nuclear concepts and calculation methods using numerous examples and illustrative computer application areas this new edition features a modern graphical interpretation of the phenomena described in the book fused with the results from research and new applications of nuclear engineering including but not limited to nuclear engineering power engineering homeland security health physics radiation treatment and imaging radiation shielding systems aerospace and propulsion engineering and power production propulsion

verkaufskategorie 1 e this textbook covers the core subjects of nuclear engineering developed to meet the needs of today s students and nuclear power plant operators the text establishes a framework for the various areas of knowledge that comprise the field and explains rather than just defines the relevant physical phenomena for today s engineer the principal analytical design tool is the personal computer the text takes advantage of this recent development pc programs are provided which either expand the computational range accessible to the student or serve to illustrate the relevant physical phenomena some of the included programs are simplified versions of computational procedures used in the field and can be used as training tool for design calculations the text devotes special attention to subjects which have an impact on the safe operation of nuclear power reactors this includes the design of safety optimized core configurations the physical mechanisms underlying the various reactivity coefficients and the calibration procedures for control rods a final chapter is devoted to the licensing and safety evaluation of power reactors

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fundamental of nuclear engineering is derived from over 25 years of teaching undergraduate and graduate courses on nuclear engineering the material has been extensively class tested and provides the most comprehensive textbook and reference on the fundamentals of nuclear engineering it includes a broad range of important areas in the nuclear engineering field nuclear and atomic theory nuclear reactor physics design control dynamics safety and thermal hydraulics nuclear fuel engineering and health physics radiation protection it also includes the latest information that is missing in traditional texts such as space radiation the aim of the book is to provide a source for upper level undergraduate and graduate students studying nuclear engineering

first published in 1986 this work should be considered as a simple introduction to nuclear engineering it covers and somewhat enlarges upon a set of courses that the author s currently give at the ecole polytechnique federale of lausanne switzerland

nuclear energy an introduction to the concepts systems and applications of nuclear processes eighth edition provides essential information on basic nuclear physics systems and the applications of nuclear energy it comprehensively covers basic concepts radiation and its uses and nuclear power providing students with a broad view of nuclear energy and science in a fast paced format that features updated timely content on topics of new and growing importance to current and future nuclear professionals such as tritium powered betavoltaic integrated circuit chips the modulation of radioactive decay constant due to solar activity monte carlo radiation transport calculations and accelerator driven systems this book is an essential resource for any first course on nuclear energy and systems contains coverage of timely topics such as the connection between hydraulic fracturing fracking radioactivity and nuclear forensics covers the terrapower traveling wave reactor the first ever fda approved drug for the treatment of acute radiation injury and more describes the industry response to the fukushima nuclear disaster including flex in the u s includes more worked examples and end of chapter exercises

nuclear engineering mathematical modeling and simulation presents the mathematical modeling of neutron diffusion and transport aimed at students and early career engineers this highly practical and visual resource guides the reader through computer simulations using the monte carlo method which can be applied to a variety of applications including power generation criticality assemblies nuclear detection systems and nuclear medicine to name a few the book covers optimization in both the traditional deterministic framework of variational methods and the stochastic framework of monte carlo methods specific sections cover the fundamentals of nuclear physics computer codes used for neutron and photon radiation transport simulations applications of analyses and simulations optimization techniques for both fixed source and multiplying systems and various simulations in the medical area where radioisotopes are used in cancer treatment provides a highly visual and practical reference that includes mathematical modeling formulations models and methods throughout includes all current major computer codes such as anisn mcnp and matlab for user coding and analysis guides the reader through simulations for the design optimization of both present day and future nuclear systems

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