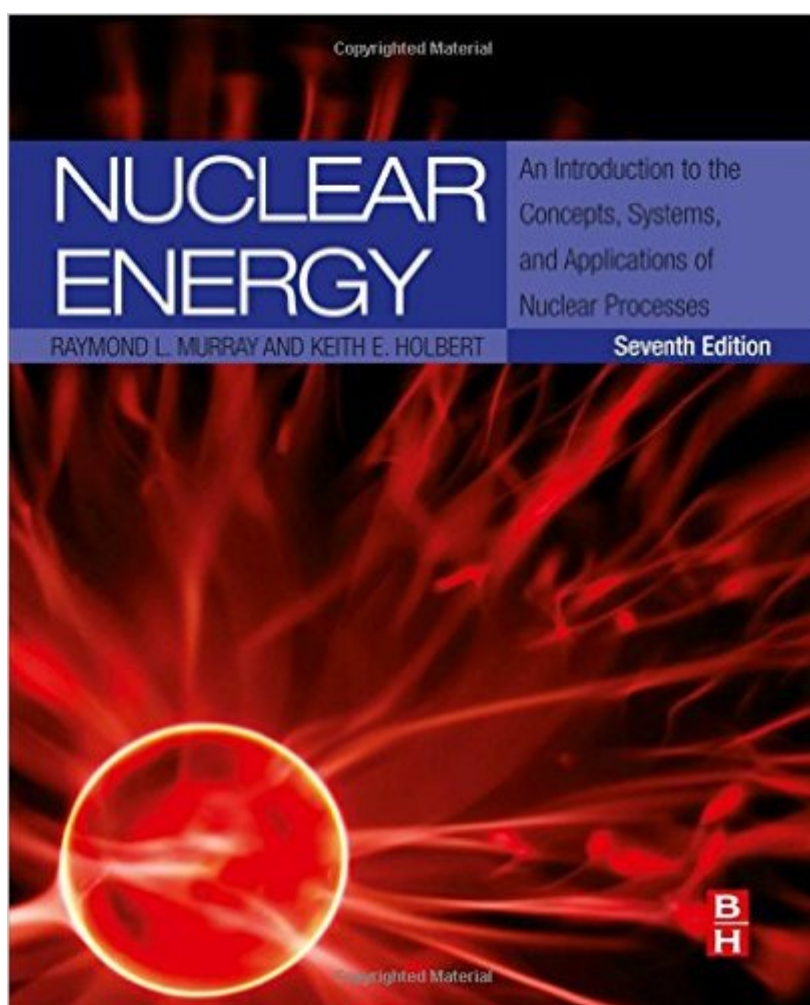# Nuclear Energy, Seventh Edition: An Introduction To The Concepts, Systems, And Applications Of Nuclear Processes

# Synopsis

Nuclear Energy is one of the most popular texts ever published on basic nuclear physics, systems, and applications of nuclear energy. This newest edition continues the tradition of offering a holistic treatment of everything the undergraduate engineering student needs to know in a clear and accessible way. The book presents a comprehensive overview of radioactivity, radiation protection, nuclear reactors, waste disposal, and nuclear medicine.  The seventh edition is restructured into three parts: Basic Concepts, Nuclear Power (including new chapters on nuclear power plants and introduction to reactor theory), and Radiation and Its Uses. Part Two in particular has been updated with current developments, including a new section on Reactor Safety and Security (with a discussion of the Fukushima Diiachi accident); updated information on naval and space propulsion; and revised and updated information on radioactive waste storage, transportation, and disposal. Part Three features new content on biological effects of radiation, radiation standards, and radiation detection.Coverage of energy economics integrated into appropriate chaptersMore worked examples and end of chapter exercisesUpdated final chapter on nuclear explosions for current geopolitical developments

# Book Information

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# Customer Reviews

"Nuclear Energy" by Raymond L. Murray now has a sixth edition available, and while I read and am reviewing the fifth edition, I encourage anyone who wants to read this generally fine book to obtain the latest edition. In this volume Murray covers a very broad swath of information, focusing on

nuclear processes and civilian nuclear power, but also delving into international aspects of nuclear power, nuclear explosions and armaments, future uses of nuclear power, regulatory issues, and waste disposal. Each chapter is well formulated, and I especially appreciated the concise summaries at the end of chapters.I found the chapters on nuclear processes to be the best in the book, and particularly enjoyed chapter 12, "Heat Generation and Removal," and found his explanation of nucleate boiling, film boiling, and departure from nucleate boiling ratio" (DNBR, p. 151) to be the most comprehensible I have ever read in an introductory text. I read the book to enhance my understanding of commercial fission reactors mostly to grasp engineered safety systems in operational reactors. In that vein, some sections of the book are a bit esoteric, although still interesting. For instance, some of the discussion in the section 14.6, "Prospects For Fusion" (p.188) goes into such things as the compact stellarator, spherical torus, reversed field pinch, spheromak, floating multipole, and z-pinch concepts in the discussion of magnetic fusion focused on the tokamak mode. My critique isn't that the material is bad, but that most readers of the book are focused on much more basic information. The fusion discussion is by no means a waste overall though, and I particularly liked the inclusion of a quote from fusion pioneer Lyman Spitzer on p.

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