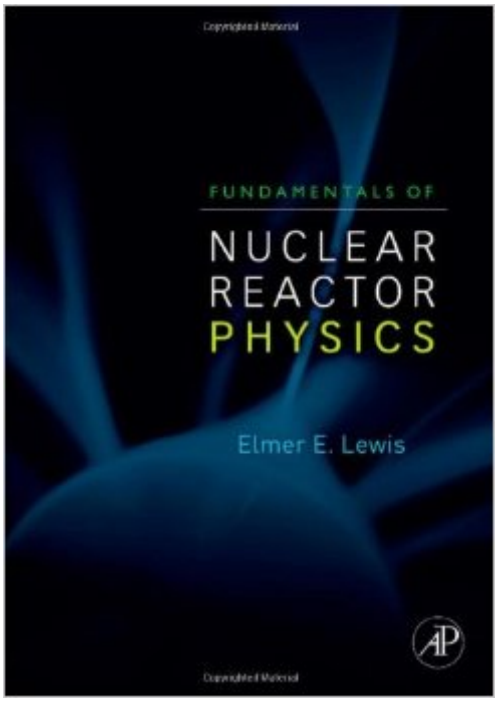
Fundamentals Of Nuclear Reactor Physics



Synopsis

This new streamlined text offers a one-semester treatment of the essentials of how the fission nuclear reactor works, the various approaches to the design of reactors, and their safe and efficient operation. The book includes numerous worked-out examples and end-of-chapter questions to help reinforce the knowledge presented. This textbook offers an engineering-oriented introduction to nuclear physics, with a particular focus on how those physics are put to work in the service of generating nuclear-based power, particularly the importance of neutron reactions and neutron behavior. Engineering students will find this applications-oriented approach, with many worked-out examples, more accessible and more meaningful as they aspire to become future nuclear engineers. Â A clear, general overview of atomic physics from the standpoint of reactor functionality and design, including the sequence of fission reactions and their energy release Â In-depth discussion of neutron reactions, including neutron kinetics and the neutron energy spectrum, as well as neutron spatial distribution Â Ample worked-out examples and over 100 end-of-chapter problems

Book Information

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Customer Reviews

I found this book to be a hindrance to my classwork. Not having example problems for this type of material should be reason enough to seek another book besides this one. It is unclear in how some terms are used in formulas, and the index is absolutely useless (doesn’t have buckling, for instance). The book focuses mainly on deriving formulas, and many of the problems are re-deriving

the formula for different conditions. It is not easy to find information in this book either: no bold titles to formulas, no pages of commonly used formulas, etc. Surely there is a better book than this.

At first sight the book looks like a reordering of materials from other well known books, such as Lamarsh or even Glasstone. Reading the preface the author explicitely mention that he wants to do this, however his promise is to do so emphasizing on modern power reactors. OK, now, how can this be done without data ? the tables on the book are so few that they seems to play a minor role in nuclear engineering, which in reality is the opposite. Now how to proceed whithout sound and well worked examples ?, or the help of modern softwares ?. The author seems to rely on the capability of the students to use some modern tools like MATLAB, MATHCAD and so on (as he request them to use those in some of the end chapter problems), however their calculations must be contrasted with real values and not just to left on whatever they can get, the book should provide at least some clear simple cases (modern ones).Also there is a quite strange ordering, like point kinetics before any Buckling ?, which comes latter on the book but it is touched very lightly, so he has to introduce a proportional parameter in the non leackage probability, and then PK is just an exercise of coupled ODE's.On the contrary there is something interesting on the very same topic, he keeps the source term so it is quite easy to analyze the effect of any external source on the evolution of neutron population, and this is interesting.Finally, where are the modern reactors ?, you may rush into the book to find the latest state of the art...but is not there either, maybe a final chapter is missing and could be the difference with conventional books.It is a pity that the book can not help that much at this stage, maybe on a revisited version, because so far it is advisable to use it a secondary source of knowledge in the field.

This book was used in my 'principle physics of nuclear reactors' class. I am currently a Junior studying mechanical engineering. This book was a decent companion for the class, and answered the majority of questions I had. The only complaint I have is that some of the integrations aren't very well explained and it just jumps to the final answer. I'm decently strong in calculus, and I realize the main equation needed is the final answer, but understanding how the equation came about is rather useful, which is why i took away a star. Other than that, great read.

This textbook contains most of the information needed to consider nuclear reactor physics. It makes a lot of assumptions and simplifications, as it is a more introductory textbook, however the principles and theory are spot on. If you're considering majoring in nuclear engineering - specifically working

on reactors, this is the book for you.