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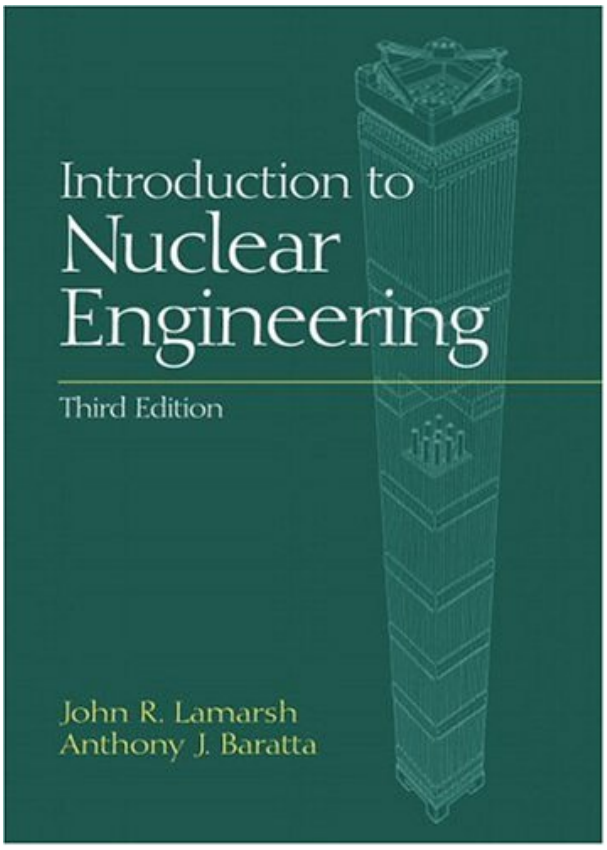

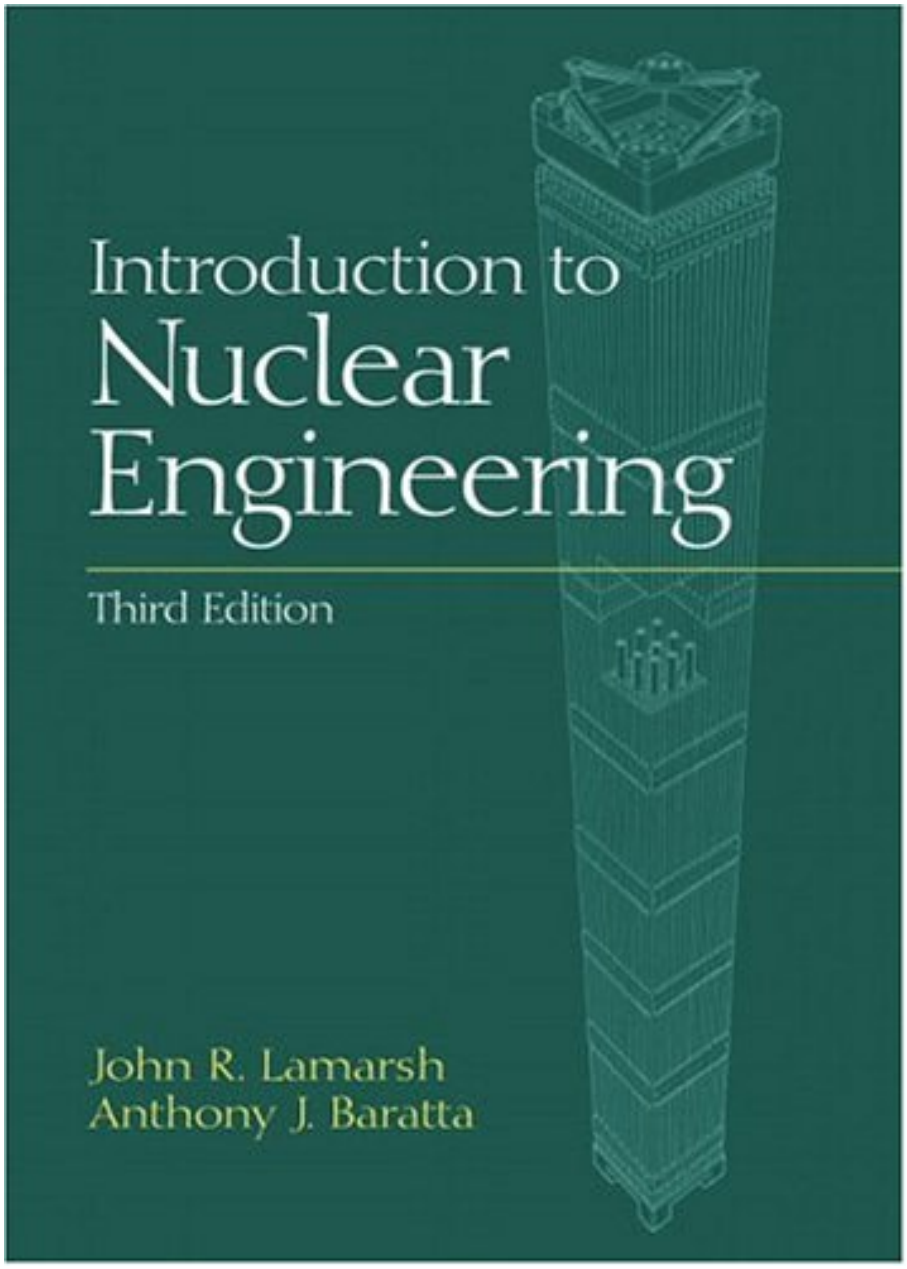

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Offering the most current and complete introduction to nuclear engineering available, this book contains new information on French, Russian, and Japanese nuclear reactors. All units have been revised to reflect current standards. Includes discussions of new reactor types including the AP600, ABWR, and SBWR as well as an extensive section on non-US design reactors; the nuclear Navy and its impact on the development of nuclear energy; binding energy and such topics as the semi-empirical mass formula and elementary quantum mechanics; and solutions to the diffusion equation and a more general derivation of the point kinetics equation. Topics in reactor safety include a complete discussion of the Chernobyl accident and an updated section on TMI and the use of computer codes in safety analysis. For nuclear engineers.

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29 of 30 people found the following review helpful.
Student Opinion of this Text
By MF
As a textbook for teaching the fundamentals of nuclear engineering, the Lamarsh-Baratta text is horrible. It is riven with errors in the text and examples (and we are using the 3rd edition), the questions are infuriatingly vague at times and in general it does a poor job of explaining an admittedly difficult subject.

Regarding the large numbers of typos, I and my classmates had to search the web for an errata sheet and

even then we continue to find errors such as formulae written incorrectly and wrong values for constants.

As for being vague, this text makes you assume many things. A favorite example is a problem early in the text where we not only have to assume neutron energies, we also had to assume fuel type. Then we have to assume energy released per fission and somehow come up with an answer we can be confident in. Ridiculous.

The examples are hit and miss - occasionally they are helpful, an omission I am sure that will be corrected in the 4th edition.

We find ourselves relying on outside texts and materials much of the time to supplement this poorly written textbook.

EDIT ADDED TWO YEARS LATER - Now with perspective from the job world...

After graduating and entering the work force, I mostly stand by the above. I will admit that I do have my copy still with me. It does provide the occasional useful overview of a wide breadth of topics.

I must once again point out the many errata. I still regard it as inexcusable even though I know mistakes do happen - but this is the 3rd edition.

Another thing that would be enormously useful would be if the next edition included units. When teaching this subject, watching how units cancel out or are used can be very, very helpful to undergrad students.

Many students will be forced to use this. I would suggest keeping it on your bookshelf, but if you are supposed to use this in your class, I strongly recommend Nuclear Reactor Engineering by Glasstone and Sesonske as a supplement. The third edition of the Glasstone book can still be found for a reasonable price if you can't afford the most recent edition.

10 of 10 people found the following review helpful.
Contains Excellent Information And Several Distractions
By Robert I. Hedges
First, the caveat to my review: I am probably unique among the reviewers of this book in that I am not a nuclear engineer. I have a strong educational and professional background in chemistry, physics, and math, and have been working on projects involving engineered safety systems and risk management in other technologically advanced industries. I have recently become involved in talks with representatives from the nuclear industry. For my own preparation I undertook the long hard slog through the Lamarsh-Baratta book, "Introduction to Nuclear Engineering" (Third Edition) to help me grasp background information and concepts in this field. Although I was sometimes initially unclear about the use of units (barns, dollars, etc.) and nomenclature (meat, safe shutdown earthquake, etc.) I generally found the text to eventually explain them adequately. One critique is that at some points in the text the authors use terminology freely without first defining it, only to define it much later. I found this and the relatively large number of typographical errors to be distracting.

This is clearly a very complex subject, and would no doubt be helped by good classroom instruction. Nonetheless, I still found considerable value in the book. I liked chapter seven, "The Time-Dependent Reactor" particularly well, and especially found sections 7.3 and 7.5 "Control Rods and Chemical Shim" and "Fission Product Poisoning" to be enlightening. I found the commentary on reactor stability and the explanation of post-shutdown Xenon-135 buildup and reactor deadtime extremely helpful. I also found

section 7.6 on incore fuel management useful.

From my experience in aviation (where it is a common parameter), I enjoyed the discussion of the utility of the Reynolds number in section 8.4, and found the ensuing discussions of turbulent flow, liquid metals, and boiling heat transfer to be fascinating. My safety systems background is primarily in aviation, where it is stressed that every design is a compromise: I was pleased to see the same acknowledged on p. 455 by Bill Minkler (who now writes the "Backscatter" commentary for "Nuclear News") with his quote that reactor design is "the art of compromise."

I was pleased with chapters nine ("Radiation Protection") and eleven ("Reactor Licensing, Safety, and the Environment"), which are the most directly applicable to me. The concept of "Relative Biological Effectiveness" is well covered beginning on p. 472, and the discussions of radiation protection are helpful. I found the section dealing with deterministic versus stochastic effects of radiation on pp. 479-480 to be helpful, and thought the glossary of radiation protection on pp. 539-542 to be a valuable reference. I wanted to better understand the principles of Monte Carlo analysis, which is covered in chapter ten, and while much of the discussion was helpful, it was a bit more general than I had expected.

The overview of reactor licensing in chapter eleven is quite helpful, although becoming a bit dated. The discussion of multiple barriers to prevent to escape of radiation begins on p. 623 and provides an excellent general overview to the safety systems involved at a reactor site. Section 11.4 ("Dispersion of Effluents") was excellent overall, with plume formation and diffusion of effluents well covered for all Pasquill conditions (except G). This was an area new to me, as I have minimal meteorological knowledge, and I found the qualitative explanations and illustrations to be excellent, although the mathematical reasoning was at some points a bit hard to follow.

The discussion of Design Basis Accidents (and particularly LOCA scenarios) beginning on p. 681 is excellent, as is the recap of the Three Mile Island and Chernobyl accidents which follow. I was pleased to see the introduction to risk management beginning on p. 711, which discusses 10CFR50.34a requiring operators to keep radioactive materials in effluents "as low as reasonably achievable." Oddly, the book the fails to name the acronym that logically follows from this (ALARA, of course) or discuss its use in the contemporary nuclear community to any significant degree.

There is a lot of great content here, and while I am sure that I missed some of the more intricate mathematical nuances of the book, I think it was helpful to me overall. The book is sometimes a bit unclear, and some of the mathematical reasoning seems a bit fuzzy. A bigger complaint is that each chapter has numerous problems at the end, yet there is no answer key to determine if you did the problem correctly.

I don't claim to have as much experience in the field as the vast majority of people who will read and review this book, but I do believe that overall the book, while not perfect, gives a good introduction to the subject, and will serve as a valuable reference in the future.

10 of 10 people found the following review helpful.
Not as bad as some claim, but not as good either
By Arthur K. Heller
I have used this book effectively for the past three years of my Nuclear Engineering Graduate degree and have a fond place for it in my heart. Admittedly there are better texts out there and the book has many typos and errors, but the advantage it has is the text is written so straight forward and plainly that most, if not all of the errors, can be found readily by the reader.

Overall, I recommend this book to someone who is new to the nuclear engineering field and is uncertain where to start with his or her study of the subject. Once the foundation has been laid by the material presented in this text the reader is ready to pursue other books, which may be more accurate, but not nearly as clear in their presentation of concepts. (such as Duderstadt and Hamilton.)

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