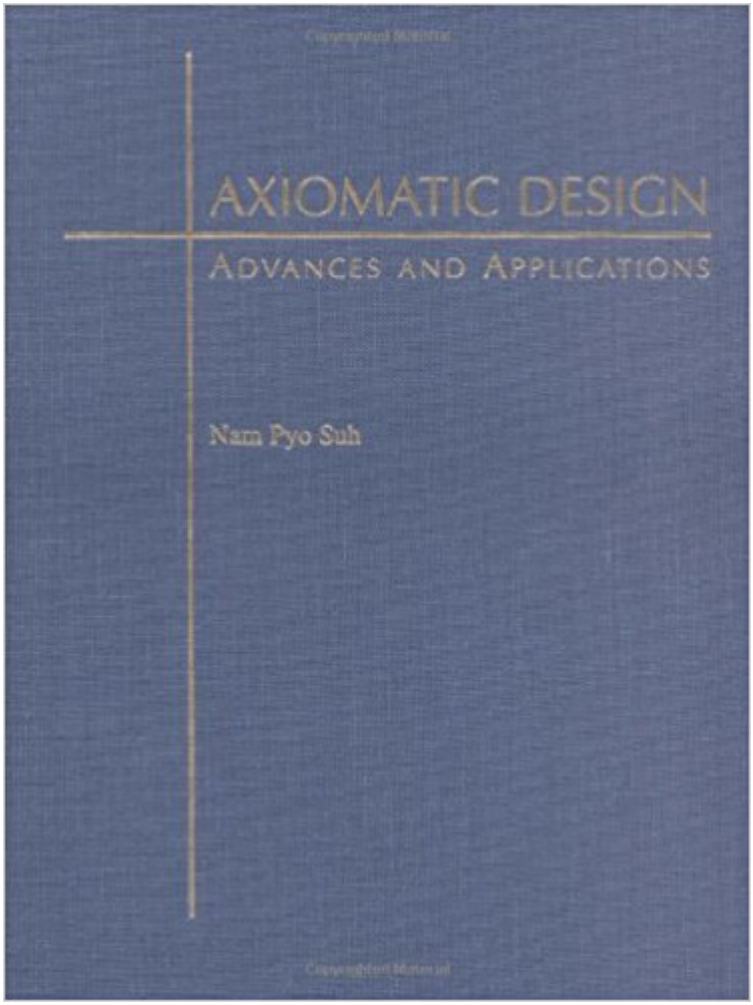
Axiomatic Design: Advances And Applications (MIT-Pappalardo Series In Mechanical Engineering)



Synopsis

Design education, research, and practice have recently seen considerable evolution as university programs, researchers, journals, and conferences systematize design as a discipline and science. Nam P. Suh’s book Axiomatic Design: Advances and Applications contributes to this systematic and scientific base and presents a fresh perspective on design, establishing a rational framework for the discipline. The book follows Suh’s successful publication, The Principles of Design (OUP 1990), although the two books are substantially different in both content and approach. The first three chapters of Axiomatic Design cover the fundamental principles of axiomatic design. The following chapters offer a complete treatment of the design of systems, software, materials and materials processing, manufacturing systems, and product design. Suh shows how a scientific and systematic approach to design improves efficiency, productivity, savings, reliability, and quality for industries that currently rely on ad hoc design systems; Axiomatic Design contains the principles and practical knowledge necessary to achieve these improvements. Perfect for senior and graduate design and mechanical engineering students as well as professional engineers, this unique text offers the tools necessary to design with ease and elegance and serves as a stepping-stone in the ever-evolving intellectual science of design.FeaturesÃ Â Applies the principles of axiomatic design to a variety of real-life situations including mechanism design, software engineering, and basic business processesÃ Â Includes numerous integrated case studies using axiomatic design to solve real-life design challengesÃ Â Draws material from consulting cases with industrial firms throughout the worldÃ Â Requires no prerequisite reading (The Principles of Design can be read for clarification)

Book Information

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Customer Reviews

"This is an original and innovative book, which builds upon and extends the area covered in Nam Suh's first book, The Principles of Design. Given Suh's eminence and far-sightedness, I think the book will be of considerable interest it a general readership, and particularly to university staff." John Crookall, Department of Mechanical Engineering, Cranfield University

Nam Pyo Suh is at Massachusetts Institute of Technology.

Every engineer who has worked in design will wonder why this method has not gotten greater traction. Absolutely a new paradigm in design methodology. Superb!

One of great emerging ideas in the past 20 years is that there are tools to help in the design of robust products and systems. There are other approaches including TRIZ, QFD and other heuristic-based methods. There are also references to Dr. Taguchi's robust design methods (DFSS). The author shows where, for instance, DFSS as applied to multi-requirement products and systems (including just about every product/system we use) has an overlooked fatal flaw. Read this book to understand what that flaw is and how to address it.Is the material here audacious? Yes. The key here is to understand where the information can be used in current engineering practice. The principle of design decoupling and Occam's Razor are not particularly new ideas but the way that the author approaches the subject is new: he uses a systematic approach that has been to date very heuristically practiced and often not well executed. If one understands the principles of software engineering, it doesn't take long to understand where the author is headed. The axioms that Suh presents are written to achieve order to the discussion. I managed to get past initial objections related to reuse of certain terminology, and seeming overemphasis on certain axioms, e.g., Suh's principle of "minimum information content" is actually a statement about "less is more" in design from a reliability and design robustness perspective.There are applications of this method and theory that are potentially powerful and effective. It has implications to systems engineering (SE) in design of physical architectures and their corresponding manufacturing and other enabling systems. This isn't a trivial contribution to the state of the art.People who need ways to handle

complexity and the total system design problem will benefit as will designers of common products. Software and hardware designers can benefit although the author uses language that is more recognizable in the realm of mechanical engineering and manufacturing systems. This material will take some time to integrate into your own storehouse of knowledge. Don’t rush it--take some time: approach with a need in hand, and with the understanding that it will likely modify your view of your discipline. Note the bibliography resources, then dig into the applications of this theory. You won’t be disappointed.

professional service. delivery on time receive it next day . I will recommend it to my friend. The product arrived on time and was well packaged. My wife has been baking some wonderful loaves of artisan-type rye, white and whole wheat breads. They are very crusty, and we had experienced some difficulty finding a product that could handle the crust. This product worked extremely well, cutting through the crust with ease. We are very pleased with our recent purchase. for my husband,

I bought this book for a readings class this semester. I don’t have a suitable vocabulary to describe how poor it is. The text is inconsistent and full of errors. The author blathers on without concluding much. He references his previous work and that of PhD theses (which I can only assume are his own students). I question the underlying assumptions of his theory but it is never fleshed out in sufficient detail to be understood and examined.Some examples:Page 8, the author discusses history, "there were no exceptions or counterexamples (to Newton’s laws) until Einstein advanced the theory of relativity". Really? How about Maxwell’s equations, the Michelson-Morley experiments, the theory of the ether, Mercury’s orbit around the Sun?Page 18, The author uses matrix algebra notation and operations on nonlinear equations. Superposition does not apply to nonlinear equations.Example 1-13, consists of a redesign problem where one constraint is "no increase in cost", and the solution to the example problem is to add a component to the existing design. And that component is free?Title of one section: "Reduction of uncertainty: Conversion of a design with time-dependent combinatorial complexity to a design with time-dependent periodic complexity".It goes on. I made it about 100 pages into it.

Is design a science? Or, can design be a science?The author tries to conclude the principles for "good designs" into two axioms, then use them as the scientific approach to conduct the design activities. It is ambitious and audacious. Unfortunately, this is a false science. The paradox of the author’s intent lies on the fact that science, by definition, should be repeatable and universal.

However, regardless of the two controversial "axioms", which have been refuted in many literature among the design community, they themselve do not guarantee that different people will arrive on the same design. They are, at most, two design principles that may not be 100% true, depending on the cases.The domain and tasks of design, is too broad and versatile to be abstracted by any "axioms", 'cause design is a mental process of creativity, and so far no one can sucessfully describe creativity in scientific terms.Therefore, the answer is "no" to the question in the beginning of the review, at least not for this book.