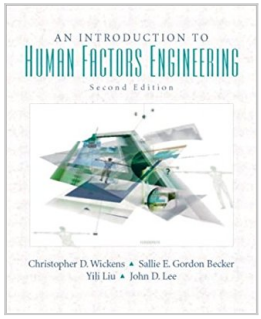

Introduction to Human Factors Engineering (2nd Edition)

By Christopher D. Wickens, John D. Lee, Yili Liu, Sallie Gordon-Becker

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This book describes the capabilities and limitations of the human operator—both physical and mental—and how these should be used to guide the design of systems with which people interact. General principles of human-system interaction and design are presented, and included are specific examples of successful and unsuccessful interactions. It links theories of human performance that underlie the principles with real-world experience, without a heavy engineering-oriented perspective. Topics include design and evaluation methods; different systems such as visual, auditory, tactile, vestibular, automated, and transportation; cognition, decision-making, and aesthetics; physiology; and stress, safety, accidents, and human error. An excellent reference for personnel and managers in the workplace.

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Editorial Review

We wrote this book because we saw a need for engineers and system designers and other professionals to understand how knowledge of human strengths and limitations, both mental and physical, can lead to better system design, more effective training of the user, and better assessment of the usability of a system. The knowledge and methods to accomplish these goals are embodied in the study of human factors engineering. As we point out in the early chapters, a *cost-benefit analysis* of human factors applications in system design usually provides a favorable evaluation of those applications.

Our intention in this book is to focus on the clear and intuitive explanation of human factors *principles.* We illustrate these principles with real-world design examples and, where relevant, show how these principles are based on understanding of the human's psychological, biological, and physical characteristics to give the reader an understanding of why the principles are formulated. Because of our focus on principles, we intentionally do not spend a great deal of time addressing psychological theory or research paradigms and experiments. We trust that the reader will know that the principles we describe are indeed based on valid research conclusions, and where relevant we provide citations as to where that research can be examined.

Also, we do not expect that this will be a stand-alone reference manual for applying human factors in design. Many specific numbers, values, and formulae, necessary for fabricating systems with human limitations in mind, were not included in this text in the interest of space. However, we point to ample references where designers can proceed to find these details.

Because of the way we have structured the book, emphasizing design principles and methodologies over theory and research, our primary target audience is the engineering undergraduate, who may well be participating in the design process. Hence we do not assume that the reader will necessarily have had an introductory course in psychology, and so we try to present some of the necessary psychological fundamentals. We also believe, however, that the book will be useful for applied psychology or undergraduate-level engineering psychology courses within a psychology department. This usefulness derives in part, because the book demonstrates how many aspects of psychological science are relevant to the effective design of systems in the workplace and on the highway.

Human factors is a growing field. In many small industries, personnel are assigned to the position of human factors engineer why have no formal training in the discipline. Thus we hope that the book will not only reach the academic classroom in both engineering colleges and psychology departments but will also be available as a reference for personnel and managers in the workplace.

We believe that the strengths of this book lie in its relatively intuitive and readable style, which attempts to illustrate principles clearly, with examples, and without excessive detail and which points to references where more information can be obtained. We have also tried to strike a balance between presenting the human factors associated with different aspects of human performance on the one hand (e.g., physical limitations, display processing, memory failures) and particularly important domains of current applications on the other. For example, there are separate chapters devoted to the human factors of transportation systems and of human computer interaction.

In the second edition, we have not made fundamental changes to content or organization. Professor John Lee

of the University of Iowa Industrial Engineering Department has been added as a co-author. He is an expert in automation and highway safety research. In addition to addressing some of the shortcomings of the previous edition, revealed by its users, we have included new sections on a variety of topics such as driver distraction, organizational aspects of human error, human factors applications to law enforcement, meta cognition, and task management. We have also increased the amount of cross referencing between chapters, to highlight the extent to which human factors is an integrated science. A single integrated reference list is compiled at the end of the chapter.

Users Review

From reader reviews:

Malissa Conlin:

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