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amples on sizing pumps and compressors for various process applications; expanded tube count tables for shell-and-tube heat exchangers; a practical approach to design against tube bundle vibration; and a comparative synopsis of the various national wind codes.

Topics included in the text are considered to be those typically encountered in engineering practice. For reasons of time and space the dynamic analyses of seismic response spectra and an extensive discussion on pulsation response spectra in piping induced by acoustic pulsation are not discussed. However, a short discussion is given on pulsation response spectra induced by acoustic pulsations. Single-phase flow is much more common in mechanical systems than two-phase flow, so because of time and space two-phase flow is not discussed.

This book is not intended to be a substitute or a replacement of any accepted code or standard. The reader is strongly encouraged to consult and be knowledgeable of any accepted standard or code that may govern. It is felt that this book is a valuable supplement to any standard or code used.

The book is slanted toward the practices of the ASME vessel and piping codes and the TEMA standard for shell-and-tube heat exchangers. The intent is not to be heavily prejudiced toward any standard, but to discuss the issue—engineering. If one feels that a certain standard or code should be mentioned, please remember that there are others who may be using different standards and it is impossible to discuss all of them.

The reader's academic level is assumed to be a bachelor of science degree in mechanical engineering, but engineers with bachelor of science degrees in civil, chemical, electrical, or other engineering disciplines should have little difficulty with the book, provided, of course, that they have received adequate academic training or experience.

Junior or senior undergraduate engineering students should find the book a useful introduction to the application of mechanical engineering to process systems. Professors should find the book a helpful reference (and a source of potential exam problems), as well as practical textbook for junior-, senior-, or graduate-level courses in the mechanical, civil, or chemical engineering fields. The book can also be used to supplement an introductory level textbook.

The French philosopher Voltaire once said," Common sense is not very common," and unfortunately, this is sometimes the case in engineering. Common sense is often the by-product of experience, and while both are essential to sound engineering practice, neither can be learned from books alone. It is one of this book's goals to unite these three elements of "book learning," common sense, and experience to give the novice a better grasp of engineering principles and procedures, and serve as a practical design reference for the veteran engineer.

A. Keith Escoe, P.E.
(from Author's Preface)

Computational Heat Transfer, by Y. Jaluria and K. E. Torrance, Hemisphere Publishing Corp., New York, 1986.

There has been a phenomenal increase in the use of computational methods for engineering applications in recent years. This is particularly true for problems in heat transfer and fluid flow, since the complexity of the governing equations generally allows analytical solutions to be obtained only for very simple cases, making it necessary to use numerical techniques for most problems of practical interest. The growing need to optimize thermal processes and systems has made it imperative to numerically simulate the relevant transport phenomena, since experimentation is usually too involved and expensive. However, available analytical and experimental results are of considerable importance in checking the accuracy and validity of numerical results. The availability of large computers has made it possible to solve diverse and complex heat transfer and fluid flow problems that arise in a wide variety of applications.

Along with the growth in the hardware capabilities of computers, substantial progress has been made, particularly in the last two decades, in the development and application of numerical techniques to heat transfer problems. There is every indication that these trends will continue. It is, therefore, important that the basic numerical techniques, as applied to heat transfer, be made available to engineering students, researchers, and professional engineers. However, much of this information can often only be obtained, rather sketchily, from research publications. Also, the textbooks on numerical analysis usually emphasize the methods, without getting into the details of the physical aspects of the problem that are often crucially important to the success of a particular numerical scheme.

This book attempts to bridge the gap between numerical methods and procedures, on the one hand, and the physical characteristics of thermal transport, on the other. The subject is developed by relating various available computational techniques to the basic heat transfer processes, and the text emphasizes the importance of the physical aspects of the problem in the selection of the most appropriate method, in the imposition of the boundary conditions, and in the verification of the numerical results. The intricacies of computational heat transfer are brought out by considering different types of basic and applied problems and the corresponding effect on the solution procedure.

To provide the mathematical background for the subject, the book first discusses, in Part 1, the nature of the equations and the relevant boundary conditions that arise in heat transfer and in the associated fluid flow. The two basic techniques of finite difference and finite element methods are discussed, and the important considerations of accuracy, stability, and convergence are outlined. This background is then employed in Part 2 to consider problems that involve the three basic transport modes of conduction, convection, and radiation. The complexities that arise in these areas are discussed, along with the relevant numerical procedures. Finally, in Part 3, a few practical circumstances are considered to demonstrate the application of computational techniques to physical processes of engineering interest. The numerical simulation of systems is also outlined. This section indicates the concerns and solutions applicable to selected practical processes that involve combined modes and complicated boundary conditions. Examples are given at various stages in the book, particularly in Part 2, to demonstrate the use of numerical methods in actual physical problems.

Y. Jaluria
K. E. Torrance
(from Author's Preface)

Heat Transfer in High Technology and Power Engineering, eds., W.-J. Yang and Y. Mori, Hemisphere Publishing Corp., New York, 1987.

In order to exchange first-hand information on research results and to promote mutual understanding and friendship for future cooperative effort in research, the U.S. National Science Foundation and the Japan society for the Promotion of Science have twice jointly sponsored binational heat

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