



Thermodynamics: Concepts and Applications

By Stephen R. Turns

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The focus of Thermodynamics: Concepts and Applications is on traditional thermodynamics topics, but structurally the book introduces the thermal-fluid sciences. Chapter 2 includes essentially all material related to thermodynamic properties clearly showing the hierarchy of thermodynamic state relationships. Element conservation is considered in Chapter 3 as a way of expressing conservation of mass. Constant-pressure and volume combustion are considered in Chapter 5 - Energy Conservation. Chemical and phase equilibria are treated as a consequence of the 2nd law in Chapter 6. 2nd law topics are introduced hierarchically in one chapter, important structure for a beginner. The book is designed for the instructor to select topics and combine them with material from other chapters seamlessly. Pedagogical devices include: learning objectives, chapter overviews and summaries, historical perspectives, and numerous examples, questions and problems and lavish illustrations. Students are encouraged to use the National Institute of Science and Technology (NIST) online properties database.

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Editorial Review

Review

"Thermodynamics can, perhaps, sometimes appear a bit of an old, somewhat involved and not very lively subject. This book demonstrates magnificently that it is a hot topic of great relevance to all aspects of technology. In a truly Herculean effort, Stephen Turns has produced a book that seems to make it impossible not to become first curious and then very well versed in the applications of thermodynamics to engineering. I think the book is ideal for any undergraduate course. It can be studied at various levels and will be an excellent source of motivation and inspiration for students...."

Henrik Jeldtoft Jensen is professor of mathematical physics, Imperial College London

About the Author

Stephen R. Turns has been a Professor of Mechanical Engineering at The Pennsylvania State University since completing his PhD at the University of Wisconsin in 1979. Before completing his PhD Steve spent five years in the Engine Research Department of General Motors Research Laboratories in Warren, Michigan. His active research interests include the study of pollutant formation and control in combustion systems, combustion engines, combustion instrumentation, slurry fuel combustion, energy conversion, and energy policy. He has published numerous refereed journal articles on many of these topics. Steve Turns is a member of the ASME and many other professional organizations and an ASME-ABET Program Evaluator since 1994. Steve is also a dedicated teacher for which he has won numerous awards including the Penn State Teaching and Learning Consortium, Hall of Fame Faculty Award; Penn State's Milton S. Eisenhower Award for Distinguished Teaching; the Premier Teaching Award, Penn State Engineering Society; and the Outstanding Teaching Award, Penn State Engineering Society. Steve's talent as a teacher is also reflected in his best-selling advanced undergraduate textbook Introduction to Combustion: Concepts and Applications 2/e. Steve's commitment to students and teaching is reflected in the innovative approach and design of Thermal-Fluid Sciences: An Integrated Approach and its companion volume Thermodynamics, also published by Cambridge University Press.

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