

Thermal Sciences

An Introduction to Thermodynamics, Fluid Mechanics and Heat Transfer

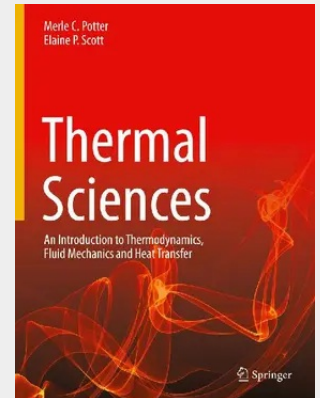
Thermal Sciences may be used in some curricula with two required courses, and in others with only one thermal science course. This text is written so it can be used in either the two-semester sequence of Thermodynamics and Fluid Mechanics or in the course that also introduces Heat Transfer. Thermodynamics and Fluid Mechanics texts have increased in length over the years so that now they each may contain 1000 pages. Much of that material is never used in the classroom and much of it tends to confuse the students with material that is not significant to the subject at hand. We have attempted to eliminate much of that material, especially the material that is most often reserved for an advanced course.

The Thermodynamics Part includes more material than can be covered in a one-semester course; this allows for selected material on power and refrigeration cycles, psychrometrics, and combustion. The Fluid Mechanics Part also contains more material than can be covered in a one-semester course allowing potential flows, boundary layers, or compressible flow to be included. The heat transfer material that is included in various chapters can be inserted, if desired, as it is encountered in the text. A one-semester service course for non-mechanical engineers may be organized with selected sections from both the Thermodynamics Part and the Fluid Mechanics Part.

Thermodynamics is presented in chapters 1 through 9, fluid mechanics in Chapters 10 through 17, and the introductory material of heat transfer is included in Sections 3.6, 4.11, and 16.6.6. All the material is presented so that students can follow the derivations with relative ease; reference is made to figures and previous equations using an easy-to-follow style of presentation. Numerous examples then illustrate all the basic principles of the text. Problems at the end of each chapter then allow for application of those principles to numerous situations encountered in real life.

The problems at the end of each chapter begin with a set of multiple-choice-type questions that are typical of the questions encountered on the Fundamentals of Engineering Exam (the exam usually taken at the end of the senior year to begin the process of licensure) and the Graduate Record Exam/Engineering. Those questions are followed with problems, often grouped according to topics and ordered by level of difficulty, which illustrate the principles presented in the text material. Answers to selected problems are included at the end of the text.

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90,94 €
84,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783031636714

Medium: Buch

ISBN: 978-3-031-63671-4

Verlag: Springer

Erscheinungstermin: 04.10.2025

Sprache(n): Englisch

Auflage: Erscheinungsjahr 2025

Produktform: Kartoniert

Gewicht: 2218 g

Seiten: 806

Format (B x H): 210 x 279 mm

