



A Guide to Thermal Physics: from the Fundamentals thru Callen-Level Equilibrium Thermodynamics

Chris McMullen

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AUDIENCE: This thermodynamics textbook is suitable for all students of thermal physics, from the third semester of introductory calculus-based physics thru more advanced coursework in thermodynamics. It provides much greater depth than the coverage of thermal physics in traditional calculus-based physics textbooks, and in this way may be useful to students who are just learning thermal physics. It also provides a solid foundation in the fundamentals and covers both introductory thermal physics (thermal expansion, heat conduction, thermal radiation, ideal gases, and heat engines) and the mathematical formulation of thermodynamics (fundamental relation, Euler and Gibbs-Duhem, thermodynamic potentials, thermodynamic systems, Maxwell relations, and phase transitions) in a more unified way; and in this way may be very helpful to students who are studying undergraduate or graduate level thermodynamics. This textbook also serves as a useful review of thermal physics and thermodynamics for students who have already studied thermodynamics.

CONTENT: The beginning chapters are largely geared toward providing a solid foundation of the fundamental concepts and their relationship with the mathematics. The material from these chapters is intended to serve as a valuable introduction for beginning students and self-learners, and also as a useful review for advanced students. The later chapters grow increasingly in-depth: For example, the treatise of heat conduction discusses the integral in a variety of forms and even compares it to more familiar electrical concepts; the chapter on heat engines derives the Carnot efficiency in general using the entropy change integral, and covers a variety of cycles, including the endoreversible engine; and thermodynamics includes not only the usual thermodynamic square, but also the more general octahedron and cross polytope.

PREREQUISITES: No previous exposure to thermal physics is assumed. The student should be familiar with the techniques of calculus; a brief review of some relevant techniques, such as partial differentiation, is included.

IMPORTANT DISTINCTIONS: Boxes of important distinctions are included in order to help students distinguish between similar concepts - like heat, temperature, and internal energy.

TABLE OF EQUATIONS: There is a handy table of equations organized by topic on the back cover of the textbook. This also includes the thermodynamic square.

CONCISE OUTLINE FORMAT: The text is conveniently organized by specific topic to help students who may not be reading straight through, but who may be searching for a specific idea or who may be reviewing material that they read previously. There is also a handy index to help locate concepts quickly. Examples and important notes clearly stand out from discussions of concepts.

MATHEMATICAL & CONCEPTUAL EMPHASIS: There is much emphasis both on learning the mathematics precisely and understanding the concepts at a deep, precise level. An underlying idea is that students should not guess at concepts, but that concepts are mathematically motivated: Let the equations be your guide.

NOTES: Several notes are boxed to describe important points, common mistakes, and exceptions. Hundreds of footnotes are included to discuss subtleties without interrupting the flow of the text.

EXAMPLES: Each chapter includes fully-solved examples to illustrate the main problem-solving strategies.

PRACTICE: The end of each chapter has a good selection of instructive conceptual questions and practice problems.

HINTS & ANSWERS: 100% of the conceptual questions have both hints and answers, since it's crucial to develop a solid understanding of the concepts in order to succeed in physics. Some of the practice problems have answers to help independent students gain confidence by reproducing the same answers, while 100% of the practice problems have hints so that students can see if they are solving the problems correctly.

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Why? Because this A Guide to Thermal Physics: from the Fundamentals thru Callen-Level Equilibrium Thermodynamics is an unordinary book that the inside of the reserve waiting for you to snap it but latter it will zap you with the secret it inside. Reading this book adjacent to it was fantastic author who have write the book in such incredible way makes the content within easier to understand, entertaining technique but still convey the meaning completely. So , it is good for you for not hesitating having this any more or you going to regret it. This book will give you a lot of advantages than the other book get such as help improving your expertise and your critical thinking technique. So , still want to postpone having that book? If I ended up you I will go to the guide store hurriedly.

Nathan Strong:

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Richard Diller:

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Naruto or Private eye Conan you can read and think you are the character on there. Therefore , not at all of book are make you bored, any it can make you feel happy, fun and unwind. Try to choose the best book in your case and try to like reading that.

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