



Advanced Engineering Thermodynamics

By Adrian Bejan

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An advanced, practical approach to the first and second laws of thermodynamics

Advanced Engineering Thermodynamics bridges the gap between engineering applications and the first and second laws of thermodynamics. Going beyond the basic coverage offered by most textbooks, this authoritative treatment delves into the advanced topics of energy and work as they relate to various engineering fields. This practical approach describes real-world applications of thermodynamics concepts, including solar energy, refrigeration, air conditioning, thermofluid design, chemical design, constructal design, and more. This new fourth edition has been updated and expanded to include current developments in energy storage, distributed energy systems, entropy minimization, and industrial applications, linking new technologies in sustainability to fundamental thermodynamics concepts. Worked problems have been added to help students follow the thought processes behind various applications, and additional homework problems give them the opportunity to gauge their knowledge.

The growing demand for sustainability and energy efficiency has shined a spotlight on the real-world applications of thermodynamics. This book helps future engineers make the fundamental connections, and develop a clear understanding of this complex subject.

- Delve deeper into the engineering applications of thermodynamics
- Work problems directly applicable to engineering fields
- Integrate thermodynamics concepts into sustainability design and policy
- Understand the thermodynamics of emerging energy technologies

Condensed introductory chapters allow students to quickly review the fundamentals before diving right into practical applications. Designed expressly for engineering students, this book offers a clear, targeted treatment of thermodynamics topics with detailed discussion and authoritative guidance toward even the most complex concepts. *Advanced Engineering Thermodynamics* is the definitive modern treatment of energy and work for today's newest engineers.

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Editorial Review

From the Back Cover

GOLD-STANDARD TREATMENT OF ENGINEERING THERMODYNAMICS, WITH COVERAGE OF THE LATEST ADVANCES IN THE FIELD

Advanced Engineering Thermodynamics is the definitive guide to this complex topic, from one of the world's leading experts in the field. Professor Adrian Bejan provides authoritative guidance on the first and second laws of thermodynamics, with a practical focus on applications within engineering fields. Expanding on the basic information covered in most textbooks, this book offers in-depth analysis and expert insight on the more advanced aspects of heat, energy, and work.

This new fourth edition includes coverage of the latest developments, including recent advances in energy storage, distributed energy systems, entropy generation minimization, and other industrial applications to highlight the current state of the field. Designed to instruct the engineers of tomorrow, this book features:

- Condensed introductory chapters that allow students to quickly review the fundamentals before diving into practical applications
- Direct links between thermodynamics and engineering topics including solar energy, refrigeration, chemical design, thermofluid design, and more
- Sustainability design and policy integrated throughout the text to provide real-world context for thermodynamics applications
- Exploration of the latest developments and emerging technologies related to thermodynamics optimization
- Additional problems, including worked problems that provide direct reference for homework and practice
- Analyses, essays, history, and graphics that work seamlessly together to explain advanced topics in thermodynamics

About the Author

ADRIAN BEJAN is the J.A. Jones Distinguished Professor of Mechanical Engineering at Duke University, and an internationally-recognized authority on thermodynamics. The father of the field of design in nature or constructal law, which accounts for the universal natural tendency of all flow systems to evolve freely toward easier flow access, his research covers a broad range of topics in thermodynamics, heat transfer, fluid mechanics, convection, and porous media. Professor Bejan has been awarded eighteen honorary doctorates by universities in eleven countries, and is the recipient of numerous awards including the Max Jacob Memorial Award (ASME & AIChE), the Worcester Reed Warner Medal (ASME), and the Ralph Coats Roe Award (ASEE). The author of over 630 journal articles, he is considered one of the 100 most-cited engineering researchers of all disciplines, in all countries.

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