

# Fundamentals of Chemical Engineering Thermodynamics (Prentice Hall International Series in the Physical and Chemical Engineering Sciences)

By Themis Matsoukas

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**Fundamentals of Chemical Engineering Thermodynamics (Prentice Hall International Series in the Physical and Chemical Engineering Sciences) By Themis Matsoukas**

## **The Clear, Well-Organized Introduction to Thermodynamics Theory and Calculations for All Chemical Engineering Undergraduate Students**

This text is designed to make thermodynamics far easier for undergraduate chemical engineering students to learn, and to help them perform thermodynamic calculations with confidence. Drawing on his award-winning courses at Penn State, Dr. Themis Matsoukas focuses on “why” as well as “how.” He offers extensive imagery to help students conceptualize the equations, illuminating thermodynamics with more than 100 figures, as well as 190 examples from within and beyond chemical engineering.

Part I clearly introduces the laws of thermodynamics with applications to pure fluids. Part II extends thermodynamics to mixtures, emphasizing phase and chemical equilibrium. Throughout, Matsoukas focuses on topics that link tightly to other key areas of undergraduate chemical engineering, including separations, reactions, and capstone design. More than 300 end-of-chapter problems range from basic calculations to realistic environmental applications; these can be solved with any leading mathematical software.

Coverage includes

- Pure fluids, PVT behavior, and basic calculations of enthalpy and entropy
- Fundamental relationships and the calculation of properties from equations of state
- Thermodynamic analysis of chemical processes
- Phase diagrams of binary and simple ternary systems
- Thermodynamics of mixtures using equations of state
- Ideal and nonideal solutions
- Partial miscibility, solubility of gases and solids, osmotic processes

- Reaction equilibrium with applications to single and multiphase reactions

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## **Editorial Review**

### About the Author

**Themis Matsoukas** has taught graduate and undergraduate thermodynamics, materials and energy balances, and various electives at Penn State—home to one of the world’s largest undergraduate programs in engineering—since 1991. He has taught thermodynamics more than twenty times, to more than a thousand undergraduate students. His honors at Penn State include the George W. Atherton Award for Excellence in Teaching (2009); the Outstanding Teaching Award, Penn State Engineering Society (2006); and the AXE: Outstanding Teacher Award (2005).

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