Foundation of Compressor Design
• Introduction
• Cycle Analysis and a Sample Design Problem
  Appendix 1: Cycle Codes

Impeller Flow Physics
• An Introduction to Impeller Flow States
• Impeller Secondary Flows
• Impeller Modeling and Design Possibilities
• Isentropic Exit Velocity Profiles
• Isentropic Incremental Efficiency Penalties
• Conclusions
  Appendix 1: Basic Modeling Choices
  Appendix 2: Numbers Describing Rotating Diffuser Phenomena

Diffusers in Centrifugal Compressor Design
• The Role of the Diffuser in Compressor Performance
• Vaneless Diffusers
• Cascade (Airfoil) Diffuser Design
• Channel Diffuser Design and Performance including Rectangular, Double Divergence, and Conical Passages
• TEIS Model Applied to Channel Diffusers
• Design Application and Modeling

Additional Stage Elements
• Introduction
• The Compressor Inlet
• Compressor Scroll Performance
• Flow Collectors
• Return Channel Performance

Stability and Range
• Review of Steady Stall
• Rotating Stall in Centrifugal Compressors
• Surge Cycles and System Modeling
• Variable Geometry and Range Extension

• Summary
  Appendix 1: An Alternative View of Rotating Stall

Strategies for Systematic Design and Optimization
• Introduction: Design Alternatives
• Design Optimization Strategies
• Three-Dimensional Analysis: The Design Tools and Usage
• Design Example: A Refrigeration Compressor

Centrifugal Compressor Experimental Development
• Experimental Examination
• Overall Measurements
• Compressor Inlet Investigations
• Rotor Cover Examination
• Rotor Exit Evaluation
• Vaneless Diffuser Studies
• Channel Diffuser Investigations
• Cascade Diffusers
• Return Channel or Deswirl Cascades
• Volute Flow Evaluation
• Further Interpretation of Data
• Closure
  Appendix 1: Test Codes

Index