

# Heat Transfer and Thermodynamics



## I. Thermodynamic Properties Measurements and Conversions

- · Energy Transfer Systems
- · Properties of Working Fluids
- · Forms of Energy
- · Work and Heat
- · Energy and Power Equivalencies
- Enthalpy
- · Phases of Matter
- · Property Diagrams

#### II. Thermodynamics

- ·The Study of Thermodynamics
- ·The First Law of Thermodynamics
- · Applications of the General Energy Equation
- ·The Second Law of Thermodynamics
- · Steam Tables
- ·Use of Saturated Steam Tables
- ·Use of Superheated Steam Tables
- ·Liquid Heat Capacity
- · Mollier Diagram

#### III. Heat Transfer Methods

- · Modes of Heat Transfer
- · Fundamentals of Heat Transfer
- · Conduction
- · Convection
- · Combined Heat Transfer
- · Radiation
- · Boiling Heat Transfer

#### IV. Heat Cycles

- · Types of Cycles
- · Carnot Cycles
- · Rankine Cycles
- · Moisture Separator Reheaters and
- · Feedwater Heaters
- · Power Plant Components
- · Typical Power Cycle
- · Overall Plant Efficiency

#### V. Heat Exchangers

- ·Types of Heat Exchangers
- · Operation of Heat Exchangers
- ·Steam Generator Heat Transfer
- · Condenser Heat Transfer

### VI. Reactor Heat Generation and Transfer

- · Power Operation In the Reactor Core
- · Factor Affecting Power Distribution
- · Indications of Core Power and Heat Generation

#### VII. Reactor Fuel Heat Transfer

- · Fuel Rod Temperature Profiles
- · Temperature Profiles Across Coolant Channels
- · Factors Affecting Reactor Heat Transfer