

PD624
Two Phase Flow and Heat Transfer

Day One

Module 1: Review of Fundamentals

- Introduction and Review of Single Phase Flow
- Laminar Flow
- Turbulent Flow
- Flow patterns

Module 2: Phase Change Principles and Fundamentals of Boiling (Chapter 3)

- Two-component Two-phase flows
- Flow patterns
- Flow effects
- Two-phase flow through orifices
- Cavitation
- Waterhammer with Phase changes

Module 3: Principles and Fundamentals of Boiling (Chapter 2)

- Thermodynamics of Phase Change
- The Boiling Curve
- Bubble Dynamics
- Boiling from External Surfaces: Nucleate Boiling
- Boiling from External Surfaces: Film Boiling
- Condensation

Day Two

Module 4: Two-Phase Flow in Pipes with Heat Transfer (Chapter 4)

- One-component Two-Phase Flow Pressure Drop Fundamentals
- Computational Models for Two-Phase Flow in Pipes
- Two-Phase Multiplier for Homogeneous Flow
- Exercises with Homogeneous Computer Model
- Two-Phase Multiplier for Separated Flow
- Heat Transfer in Internal Two-Phase Flow
- Friction Pressure Loss in Subcooled Nucleate Boiling

Module 5: Special Topics in Two-Phase Flow and Heat Transfer

- Critical Heat Flux (CHF) in Internal Two-Phase Flow (Chapter 5)
- Flow Instability in Internal Two-Phase Flow (Chapter 6)
- Class Discussion of Experiences with Two-Phase Flow