AIChE® INSTRUCTOR LED TRAINING

Course Number: CH294	Course Title: **Heat Exchanger Design and Operation**
http://www.aiche.org/education/courses/ch294/heat-exchanger-design-and-operations	

- **Types and applications of heat exchangers**
  - Types
    - shell-and-tube heat exchangers
    - air coolers
    - plate-frame exchangers
    - compact plate-fin exchangers
  - Applications
    - single-phase
    - boiling/evaporation
    - condensation

- **Fundamentals of heat exchanger performance**
  - Energy balance
  - Rating methods
    - ***F-LMTD***
    - ***e-NTU***
    - incremental computer-based
  - Pressure drop
  - Performance margins
    - fouling factors
    - cleanliness factor

- **Heat exchanger selection criteria**
  - Cost
  - Operating conditions
    - transient
  - Maintenance needs
    - cleaning schedule
  - Material selection
    - fluid compatibility
  - Mechanical considerations
    - temperature and pressure

- **Single-phase applications**
  - Heat transfer coefficients
  - Pressure drop
  - Extended surfaces
  - Enhancements

        - tube inserts

- **Boiling applications**
    - Boiling fundamentals
        - pool boiling
        - flow boiling
    - Two-phase pressure drop
    - Typical services
        - refrigerant evaporators
        - reboilers
- **Condensing applications**
    - Condensing fundamentals
        - film condensation
        - condensing regimes
    - Pressure drop considerations
    - Condenser geometries

- **Operational problems**
    - Fouling
    - Vibration
    - Venting and draining
    - Reboiler problems
        - instability
        - film boiling
    - Temperature pinch

- **Troubleshooting**
    - Use of field data
        - accuracy of measurements
        - accuracy of performance models
    - Inspections
        - typical mechanical defects/degradation