Introduction to Properties of Refractories course outline

Day 1

- Thermal Properties
  - Volume Stability
    - Reversible Changes
    - Irreversible or Permanent Changes
  - Heat Capacity
  - Thermal Conductivity
- Laboratory Demonstrations
  - Thermal Expansion – ASTM E228
  - Thermal Conductivity (Steady State) – ASTM C201
  - Thermal Conductivity (Transient) – ASTM C1113

Day 2

- Mechanical Properties
  - Elasticity
  - Brittle Fracture
  - Creep
- Laboratory Demonstrations
  - Elasticity – ASTM C1548
  - Strength (Flexural and Compressive) – ASTM C133
  - Creep – ASTM C832

Day 3

- Thermo-Mechanical Properties
  - Thermal Stresses
  - Thermo-Elastic Theory
  - Thermal Shock Damage Resistance Theory
- Laboratory Demonstrations
  - Fracture Surface Energies – $\gamma_{NBT}$ and $\gamma_{WOF}$
  - Thermal Shock – ASTM C1171

Day 4

- Corrosion Properties
  - Fundamental Principles of Liquid-Solid Corrosion
  - Liquid Phase Formation
    - Wetting
    - Phase Equilibrium Diagrams
- Laboratory Demonstrations
  - Melting Behavior – ASTM C24
  - Static Corrosion – ASTM C621
  - Dynamic Corrosion – ASTM C874