Day 1

- **Module 1: General Material Requirements**
  - Acceptable Material
  - Purchasing
  - Receipt
  - Reconciliations
  - Identification and Traceability
  - Interaction with the PED
  - New Materials
  - Review questions
  - *Exercise: Reviewing a Material Test Report*
  - *Exercise: Resolving Material issues*

- **Module 2: General Design Requirements**
  - Use of Code Case 2695
  - Applying Code Formulas
  - Formula Input Variables
  - Allowable Stress Values
  - Joint Efficiencies
  - RT Designators
  - Review questions
  - *Exercise: Perform a shell and head calculation using a set of hypothetical user design requirements*
  - *Exercise: Add nozzles to the shell and head, and verify the adequacy of their opening reinforcement, weld sizing, and weld strength*

- **Module 3: Using the Design Appendices**
  - Custom Bolted Flanges (Appendix 2 & Y)
  - Jacketed Vessels (Appendix 9)
  - Noncircular Vessels (Appendix 13)
  - Dimpled Jackets (Appendix 17)
  - Review questions
  - *Exercise: Prepare an Appendix 2 flange calculation*

Day 2

- **Module 4: General Fabrication Requirements**
  - Forming and Cutting
  - Forming Tolerances
  - Post Forming Stress Relief
  - Review questions
Exercise: Evaluate a formed head for extreme fiber elongation and determine if post forming stress relieving is required.

Exercise: Evaluating a formed head for shape tolerances, determining corrective actions

Module 5: Requirements for Welded Construction
- Weld joint alignment/offsets
- Inspection of weld joint fit-up
- WPS Qualifications
- Welder Qualifications
- NDE requirements
- RT vs UT
- Visual Inspection of welds
- Review questions
  - Exercise: Determine the allowable offset and whether tapered transition requirements apply on a hypothetical head to shell fit-up.
  - Exercise: Requirements for applying UT in lieu of RT

Module 6: Toughness and Testing Requirements
- UG-84 Testing Rules
- Part UCS Testing and Exemption
- Governing Thickness
- Exemption Curves
- Part UHA Testing and Exemption
- Part UNF Testing and Exemption
- Part UHT Testing and Exemption
- Review questions
  - Exercise: Evaluate a hypothetical carbon steel vessel design for toughness requirements
  - Exercise: Evaluate a hypothetical stainless steel vessel design for toughness requirements

Day 3

Module 7: Pre-heat and Post-weld Heat Treatment Requirements
- Part UCS
- Part UHA
- Part UNF
- Part UHT
- Review questions
  - Exercise: Apply PART UW and Part UCS rules for PWHT to a hypothetical vessel design and write a PWHT procedure
• Module 8: General Testing and Certification Requirements
  – Hydro Testing
  – Pneumatic Testing
  – Proof Testing
  – Test Temperature
  – Test Gages
  – Review questions
  – Exercise: Apply the rules of UG-99 to a pressure vessel for a normal and “New and Cold” pressure test

• Module 9: Overpressure Protection
  – Types of Pressure Relieving Devices
  – Design and Material Requirements
  – Set Pressure Requirements
  – Installation Requirements
  – Device Certification
  – Review questions

• Module 10: Applying the Code Mark and Preparing the Manufacturer’s Data Report
  – Nameplate/Stamping Arrangement
  – Manufacturer’s Data Report Prep and Certification
  – Review questions