**Outcome:** Students will be able to define and explain the reason for and the function of equipment and process interlocks, permissives, and Safety Instrumented Systems. Students will demonstrate their ability to read and analyze logic systems including their ability to solve “what if” scenarios. The students will utilize the ICC logic and circuits trainer(s) to build, test, and troubleshoot various logic scenarios and sequences reinforcing their understanding of process logic systems and applications.

**Lecture:** Lecture to review:

1. What are Process Logic systems?
2. There use in the process industries
   1. Interlocks, Permissives
   2. Safety Instrumented Systems (SIS)
      1. Process Shutdown.
         1. Shutdown strategies
3. Examples of typical logic applications
   1. BMS
   2. Pump Interlocks
4. Basic Logic Concepts
   1. Outputs
      1. True, yes, 1, permitted
      2. False, no, 0, not permitted
   2. Common Logic Operators and Their Function
      1. And
      2. Or
      3. Not/Inverse
      4. Value
5. Logic Symbology
6. Reading Logic Diagrams
   1. BPC
   2. MP-REC
   3. Other Examples
7. Input Voting
   1. Simplex
   2. Redundant
   3. 2 oo 3 voting

**Demo(s):**

1. HOT Unit (GRHS)
   1. Show and demonstrate logic applications utilized on the HOT unit.

**Lab:**

1. Small Systems Lab (ICC)

a. Design, build and test various logic scenarios and sequences utilizing the ICC logic trainer.

**Homework:**

1. Students are required to use the proper symbology in all discussions and documents.
2. Students to identify and analyze various logic systems commonly utilized in daily applications.

**Documentation:**

1. Logic Lecture .ppt
2. Logic Resources:
   1. ISA S5.1-2009
   2. Hot unit P&ID
   3. MP P&ID
   4. BPC P&ID

**Assessment:**

1. Homework
2. Lab Work
3. Lab Safety
4. Quiz(s) & Final Exam