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|  | **Course:** | **PRO 120** |
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|  | **Title:** | **Process Technology I:Equipment** |
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|  | **Long Title:** | **Process Technology I: Equipment** |
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|  | **Course Description:** | **Provides an overview or introduction into the field of equipment within the process industry. This course will introduce many process industry-related equipment concepts including purpose, components, operation, and the Process Technician's role for operating and troubleshooting the equipment.** |
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|  | **Min Credit:** | **4** |
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 STANDARD COMPETENCIES:

1. List types of equipment used in refining and petrochemical industries
2. Describe equipment operations and appropriate uses common to the refining and petrochemical industries
3. Explain pressure and temperature limits of hoses and fittings
4. Discuss selection and sizing criteria as related to pressure, temperature, flow and corrosiveness of fluids
5. Describe the operating principles of centrifugal pumps
6. Describe the operating principles of positive displacement pumps
7. Identify the common types/applications of compressors
8. Describe the operating principles of compressors
9. Describe safety and environmental hazards associated with compressors
10. Identify typical procedures associated with compressors
11. Identify the common types and applications of turbines
12. Describe the operating principles of turbines
13. Identify typical procedures associated with turbines
14. Identify the common types and applications of motors and engines
15. Describe the operating principles of motors and engines
16. Identify typical procedures associated with motors and engines
17. Identify typical problems associated with motors and engines
18. Describe the principles of transmission and lubrication
19. Identify typical procedures associated with transmission and lubrication
20. Identify typical problems associated with transmission and lubrication
21. Identify the common types and applications of heat exchangers
22. Describe the operating principles of heat exchangers
23. Identify typical problems associated with heat exchangers
24. Identify the common types of cooling towers
25. Describe the operating principles of cooling towers
26. Identify typical problems associated with cooling towers
27. Identify the common types and applications of furnaces
28. Identify typical problems associated with furnaces
29. Identify the common types and applications of boilers
30. Identify typical procedures associated with furnaces and boilers
31. Identify typical problems associated with boilers
32. Describe the purpose of filters and dryers in the process industry
33. Describe the operating principles of filters and dryers
34. Identify typical procedures associated with filters and dryers
35. Identify typical problems associated filters and dryers
36. Recall the common types and applications of vessels
37. Identify typical procedures associated with vessel operation and maintenance
38. Identify typical problems associated with vessels
39. Explain the purpose of diagrams including why, when and where they are used
40. Identify components on a typical PFD and Piping and Instrumentation Diagram (P&ID)

 TOPICAL OUTLINE:

1. Introduction to Equipment and Tools
   1. Types of equipment used in process technology
2. Overview ¿ Piping, Tubing, Hoses and Fittings
   1. Uses of pipe, tubing and hoses
   2. Piping thickness and rating
   3. Types of connections and sealant compounds
   4. Different hose fittings
   5. Typical problems with pipe, tubing and hoses
3. Valves
   1. Common valve types
   2. Safety and environmental concerns associated with valves
4. Pumps
   1. Common pump types
   2. Typical problems with various pumps
   3. Procedures associated with pumps
5. Compressors
   1. Common types and applications of compressors
   2. Operating principles of compressors
   3. Safety and environmental hazards
   4. Typical problems with compressors
6. Turbines
   1. Common types and applications of turbines
   2. Operating principles of turbines
   3. Safety and environmental hazards
7. Motors and Engines
   1. Common types and applications of motors and engines
   2. Operating principles of motors and engines
   3. Safety and environmental hazards
8. Power Transmission and Lubrication
   1. Purpose of major transmission components
   2. Types of bearings
   3. Safety and environmental hazards
9. Heat Exchangers
   1. Common types and applications of heat exchangers
   2. Components and their purpose in relation to heat exchangers
10. Cooling Towers
    1. Common types of cooling towers
    2. Operating principles of cooling towers
    3. Safety and environmental hazards
    4. Operation and maintenance
11. Furnaces
    1. Common types and applications of furnaces
    2. Components and their purpose of furnaces
    3. Safety and environmental hazards
12. Boilers
    1. Common types and applications of boilers
    2. Operating principles
    3. Safety and environmental hazards
13. Filters and Dryers
    1. Purpose of filters and dryers in process technology
    2. Operating principles of filters and dryers
    3. Safety and environmental hazards
14. Vessels
    1. Common types and applications of vessels
    2. Purpose of each component
    3. Operating principles of vessels
    4. Safety and environmental hazards
15. Process Diagrams
    1. Purpose of diagrams
    2. Symbols uses