**COETC Course Map**

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| **Course Name:** Open PRO 120 Process Technology I: Equipment |
| **Instructor Name:**  |  |
| **Course Competencies:**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. |
| 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
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| **REQUIRED TEXTBOOK/MATERIALS:**Process Technology Equipment ISBN # 978-0-13-700412-6s |

| **Module # and Title** | **CCNS Competencies** | **Instructional Materials** | **Activities: Learner Interaction** **& Engagement** | **Assessments and Rubrics** |
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| 1. **Introduction to Equipment and Tools**
 | 1, 2 | * Module 1 PPT – Introduction.ppt
* Example Distillation Unit
* YouTube Video link
 | * Module 1 Handout.pdf
 | Check Your Knowledge |
| 1. **Pipes, Valves, Tanks and Vessels**
 | 3, 4, 36, 37, 38 | * Piping, Tubing, Hoses, Fittings.ppt
* Valves.ppt
* Tanks & Vessels.ppt
* YouTube Video links
 | * Piping, Tubing Handout
* Valves Handout
* Tanks & Vessels Handout
 | Label the Parts of a Storage Tank |
| 1. **Pumps and Compressors**
 | 5, 6, 7, 8, 9, 10 | * Pumps.ppt
* Compressors.ppt
* YouTube Video links
 | * Pumps Handout
* Compressors Handout
 | Check Your Knowledge |
| 1. **Process Drawings and Turbines**
 | 11, 12, 13, 39, 40 | * Process Drawings and Equipment Standards.ppt
* Turbines.ppt
* YouTube Video links
 | * Process Drawings and Equipment Standards Handout
* Turbines Handout
 | * Check Your Knowledge
* Block Flow Diagram
* Label the Components of This Turbine
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| 1. **Electrical Distribution, Motors, Engines, and Mechanical Power**
 | 14, 15, 16, 17, 18, 19, 20 | * Electrical Distribution and Motors.ppt
* YouTube Video links
 | * Electrical Distribution and Motors Handout
 | * Check Your Knowledge
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| **Mid Semester Reflection** |  |  |  | * Mid Semester Review
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| 1. **Heat Exchangers and Cooling Towers**
 | 21, 22, 23, 24, 25, 26 | * Heat Exchangers.ppt
* Cooling Towers.ppt
* YouTube Video links
 | * Heat Exchangers Handout
* Cooling Towers Handout
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| 1. **Furnaces and Boilers**
 | 27, 28, 29, 30, 31 | * Furnaces.ppt
* Boilers.ppt
* YouTube Video links
 | * Furnaces Handout
* Boilers Handout
 | * Check Your Knowledge
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