**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 |
| 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 |
| **Mid Semester Reflection** |  |  |  | * Mid Semester Review |
| 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 |  |
| 1. **Furnaces and Boilers** | 27, 28, 29, 30, 31 | * Furnaces.ppt * Boilers.ppt * YouTube Video links | * Furnaces Handout * Boilers Handout | * Check Your Knowledge |