Selkirk College

Refrigeration Plant Operator
Course Outline with Outcomes
Part 1

1. **Boiler & Pressure Vessels Act**
   Discuss the purpose of the jurisdictional acts/regulations pertaining to the operation of boilers and pressure equipment.
2. **Introduction to CSA & ASME Codes for Boilers**
   Demonstrate a working knowledge of the CSA codes and the ASME codes of concern to the 5th Class Power Engineer.
3. **Introduction to Thermodynamics**
   Explain the principles of thermodynamics, including the laws of thermodynamics and the modes of heat transfer.
4. **Thermodynamics of Refrigeration**
   Explain the terms and principles associated with the thermodynamics of refrigeration.
5. **Introduction to Basic Mechanics**
   Define basic terms used in the study of mechanics.
6. **Welding Methods & Inspection**
   Describe oxyacetylene welding and electric arc welding and the applications of each.
7. **Welding Terms, Forge & Fusion Welding Processes**
   Describe welding terms and methods of weld inspection.
8. **Types of Pumps**
   Describe the design and operation principles of various types of pumps used in building and industrial plants.
9. **Pump Operation & Maintenance**
   Describe the major considerations and procedures for pump operation and maintenance.
10. **Introduction to Piping & Pipe Fittings**
    Discuss the basic types of piping, piping connections, supports and drainage devices used in industry.
11. **Introduction to Valves**
    Discuss the design and uses of the valve designs most commonly used in industry and on boilers.
12. **Lubrication Principles**
    Describe the importance of lubrication and the principles concerned with lubrication.
13. **Air Compression**
    Describe the operating principles of the different types of air compressors.
14. **Fires & Extinguishing Media**
    Describe the fire classifications and the types of extinguishing media suitable for each classification.
15. **Portable Fire Extinguishers**
    Describe the types of portable fire extinguishers, and their application for each fire classification.
16. **Building Safety**
    Describe how the Power Engineer can prevent accidental situations to protect the occupants of their facility.

17. **First Aid & CPR for Adult Casualties**
    Identify possible or potential medical difficulties in a person, and provide assistance until professional medical aid can be obtained.
18. **Introduction to Electricity**
    Discuss the design and accessories of an electrical circuit; describe the design and troubleshooting of lighting systems and electric motors.
19. **Refrigerants**
    Describe the different refrigerants and explain the classification and various properties of each refrigerant.
20. **Environmental Impact of Chlorinated Hydrocarbons**
    Describe the nature and impact of chlorinated hydrocarbons on the environment.

Part 2

21. **Compression Refrigeration Systems**
    Describe the operating principles of compression refrigeration systems.
22. **Absorption Refrigeration Systems**
    Describe the operating principle of the absorption refrigeration systems.
23. **Refrigeration Compressors**
    Describe the operating principles and the components of refrigeration compressors.
24. **Heat Exchangers for Refrigeration Systems**
    Describe the different types of heat exchangers used in refrigeration systems.
25. **Cooling Towers**
    Describe the operation and maintenance of cooling towers.
26. **Refrigeration Metering Devices**
    Describe the operating principles of refrigeration metering devices and capacity controls.
27. **Refrigeration Accessories**
    Describe the various accessories used in refrigeration systems.
28. **Refrigeration Cycle Controls**
    Describe the purposes and operating principles of the operational and safety controls on a refrigeration system.
29. **Compression Refrigeration System Pre-Startup Procedures**
    Describe the various operation and maintenance procedures used on compression refrigeration systems.
30. **Compression Refrigeration System Operations**
    Describe the various operation and maintenance procedures used on compression refrigeration systems.
31. **Absorption Refrigeration System Operation & Maintenance**
    Describe the various operation and maintenance procedures used on absorption refrigeration systems.
32. **Psychrometric Properties of Air**
    Describe the psychrometric properties of air.
33. **Application of the Psychrometric Chart**
    Solve problems using a psychrometric chart.
34. **Fans for Air Distribution Systems**
    Describe the air flow behaviour and movement of air through distribution systems.
35. **Ventilation & Air Filters**
    Describe the various ventilation systems found in buildings, as well as describe the various types of air filters used in these systems.

36. **Air Conditioning Duct Systems**
    Describe the designs and components of duct systems used in air conditioning.
37. **Humidification**
    Explain the equipment and principle of humidification.
38. **Coil Types**
    Describe the various types of coils used in air conditioning systems.
39. **Coil Operation**
    Describe the operation of the various types of coils used in air conditioning systems.
40. **Air Conditioning Systems I**
    Describe the operation of various air condition systems.
41. **Air Conditioning Systems II**
    Describe the design and operation of combined air conditioning systems and explain the factors to consider when selecting an air conditioning system.
42. **Air Conditioning Heat Recovery Systems**
    Explain the purpose; design and operation of heat recover in air conditioning systems.
43. **Air Conditions System Controls**
    Describe the control systems used in air conditioning.