

1. Module details**Module name****Commissioning Commercial / Industrial Refrigeration Systems****Module duration**

0.5 module (18-20hrs)

Module code

NUE357

Discipline code**2. Module purpose**

To enable students to commission Commercial / Industrial Refrigeration Systems and all associated plant and equipment that is the responsibility of a mechanical services technician

3. Prerequisites

EA130 Commissioning HVAC Systems

4. Relationship to competency standards

NES404e, NES503e, NES303e

5. Content**1. Fundamentals**

- Building specifications/requirements/responsibilities
- Building Codes
- Local Government regulations
- Design conditions
- Reporting procedures
- Review fluid mechanics principles
- Pre – commissioning checks

2. Air Systems (excluding air balancing)

Air Tabulation instruments

- air flow
- pressure
- temperature
- fan testing
- leakage testing
- system capacity calculations

3. Hydronic Systems

Hydronic tabulation instruments

- fluid flow
- pressure
- temperature
- Pumps
- Pump curves and system curves
- Pump testing
- Hydronic
 - balancing procedures

- general
- compensation method
- Balancing valves
- Capacity calculations

4. Refrigeration Systems

- AS1677
- HB40
- Pressure testing
- Evacuation
- Charging
- Control setting
- Commissioning reports
- System performance and capacity

5. Plant and equipment

- Controls
- Heat exchangers
- Chillers
- Boilers
- Cooling towers

6. Assessment strategy

Assessment methods

Short answer questions, practical exercises, assignment and on site commissioning and evaluation of equipment

Conditions of assessment

7. Learning outcome details

Learning outcome 1

Read and interpret building mechanical service installation specifications, building codes and local government regulations, compile and report performance levels to industry standards.

Assessment criteria

- 1.1 Interpret system specifications from design documentation.
- 1.2 Apply relevant building codes and local government regulations to a commissioning project.
- 1.3 Explain the application of fluid mechanic principles as applied to refrigeration system installations

Learning outcome 2

Correctly test, and adjust total system air quantities using appropriate instruments on refrigeration systems given the specifications,

Assessment criteria

- 2.1 Accurately use air measuring test instruments

	<p>2.2 Correctly test and adjust total system air quantities</p> <p>2.3 Calculate system capacity air side</p>
Learning outcome 3	Correctly test, adjust and balance a chilled water system using appropriate instruments, given the specifications
Assessment criteria	<p>3.1 Accurately use fluid flow measuring test instruments</p> <p>3.2 Correctly test, adjust and balance a chilled/heating water system used in a refrigeration system installation.</p> <p>3.3 Calculate system capacity - water side.</p>
Learning outcome 4	Effectively commission commercial / industrial refrigeration (cooling) system, per relevant codes and regulations
Assessment criteria	<p>4.1 Pressure test, evacuate and charge system</p> <p>4.2 Test and adjust refrigeration system and controls</p> <p>4.3 Complete a commissioning report</p>
Learning outcome 5	Correctly test, adjust all associated refrigeration system plant and equipment
Assessment criteria	<p>5.1 Commission to given specifications:</p> <ul style="list-style-type: none"> • control system • chiller (reciprocating & centrifugal) • boiler (gas and oil fired) • cooling tower • heat exchanger
8. Delivery of the module	
Delivery strategy	Class room, Practical workshop, On site commissioning, and Assignment
Resource requirements	
Occupational health and safety requirements	Students should be made aware of occupational health and safety issues in all situations and be expected to demonstrate safe working practices at all times.