



## Model Curriculum

**NOS Name:** Essentials of Refrigeration and Air Conditioning

**NOS Code:** ELE/MCr-0001

**NOS Version:** 1.0

**NSQF Level:** 3

**Model Curriculum Version:** 1.0

Electronics Sector Skills Council of India || 155, 2<sup>nd</sup> Floor ESC House, Okhla Industrial Area – Phase 3,  
New Delhi - 110020



## Table of Contents

Training Parameters .....	3
Program Overview.....	4
Training Outcomes.....	4
Compulsory Modules .....	4
Module Details.....	5
Module 1: <i>Installation, charging, Servicing, and Maintenance of Low GWP RAC</i> .....	5
Annexure .....	7
Trainer Requirements .....	7
Assessor Requirements .....	8
Assessment Strategy .....	9
References .....	11
Glossary .....	11
Acronyms and Abbreviations.....	12





## Module Details

### Module 1: Installation, charging, Servicing, and Maintenance of Low GWP RAC

Mapped to ELE/MCr-0001 : Essentials of Refrigeration and Air Conditioning

#### Terminal Outcomes:

Upon completion of the module on Installation, charging, Servicing, and Maintenance of Low GWP RAC, students will be able to:

- Proficiently install, service, and maintain refrigeration and air conditioning systems to industry standards.
- Demonstrate comprehensive understanding and application of environmental regulations and safety protocols in refrigerant handling.
- Efficiently diagnose and resolve complex technical issues related to RAC systems, ensuring optimal performance.

*Duration: 07:00 hrs*

#### Theory - Key Learning Outcomes

- Understand environmental regulations: Montreal Protocol, Kigali Amendment, and their impact on refrigerants.
- Explain the vapor compression cycle, heat transfer principles, and air-conditioning system components.
- Identify properties and classifications of refrigerants like HFC-32, and low-GWP alternatives.
- Apply safety protocols for handling flammable refrigerants, ensuring workplace safety and compliance.
- Describe energy efficiency practices and their importance in RAC systems.
- Explain the technician certification process, roles of HPMP, and international standards for certification.

*Duration: 08:00 hrs*

#### Practical - Key Learning Outcomes

- Perform refrigerant recovery, brazing, leak testing, vacuum holding, and routine maintenance effectively.
- Demonstrate installation skills for split air-conditioners, including proper location selection and refrigerant tube connection.
- Conduct comprehensive servicing practices for RAC systems, including cleaning, flushing, and pressure testing.
- Implement safety measures when working with flammable refrigerants, ensuring safe handling and storage.

- Communicate professionally with customers and team members, maintaining service quality and customer satisfaction.

#### **Classroom Aids: (If Offline mode)**

- Whiteboard and Markers
- Chart paper and sketch pens
- LCD Projector and Laptop for presentations

#### **Tools, Equipment and Other Requirements**

Labs equipped with the following:

- Tools: Brazing equipment, refrigerant recovery machine, vacuum pump, manifold gauge set, leak detectors.
- Equipment: Split air-conditioners (IDU and ODU), refrigeration tubing, safety gear for handling refrigerants.

## Annexure

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate Science & Engineering	Electrical/ Mechanical/ Electronics	0	RAC	1	RAC	
Diploma/ITI	Electrical/ Mechanical/ Electronics	1	RAC	1	RAC	

Trainer Certification	
Domain Certification	Platform Certification
<p><b>“Essentials of Refrigeration and Air Conditioning, ELE/MCr-0001 version 1.0”.</b> Minimum accepted score is 80%.</p>	<p>Recommended that the Trainer is certified for the <b>Essentials of Refrigeration and Air Conditioning “Trainer (VET and Skills)”</b>, mapped to the Qualification Pack: “MEP/Q2601, V2.0”, with minimum score of 80%</p>







- Centre photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives



