Name of the Programme– Vocational Diploma in Refrigeration & AC Technician - Syllabus (Flexible Skill Training Mode)

Course Title	**Refrigerator and Refrigeration**
Course Code	**VDRA-1**
Course Credit	**4**

Course Objectives

While studying the **Refrigerator and Refrigeration**, the student shall be able to:

- Explains the basics of refrigeration and the types of refrigeration
- Elaborates the major components of Refrigerator
- Describes the types of refrigerants used in refrigerator
- Elaborates about the maintenance and trouble shooting of refrigerator
- Enumerates the step by step procedure of repairing and servicing of refrigerator and its parts

Course Outcomes

After completion of the **Course Refrigerator and Refrigeration**, the student will be able to:

- Define the laws of Thermodynamics
- Elaborate the various refrigeration cycles and the process of refrigeration
- Identify and enumerate about the major parts of refrigerator namely compressor, evaporator, condenser etc.
- List the characteristics of an ideal refrigerant
- Demonstrate the procedure of care, maintenance, repair and servicing of various parts of refrigerator

Block-1: Basics of Refrigeration

Unit-1 – Fundamentals of Refrigeration

Introduction - Basic Terminology – Thermodynamics - Laws of Thermodynamics

Unit-2: Refrigeration Cycles

Process of Refrigeration - Methods of Producing Low Temperature - Air Cycle Refrigeration - Vapour Compression Cycle of Refrigeration - Vapour Absorption Cycle

Block-2: Major Components of Refrigerator

Unit -3: Components of Refrigeration System

Compressor – Condenser – Evaporator - Expansion Devices

Unit -4: Refrigerants

Introduction - Refrigerant Criteria - Designation of Refrigerants - Types of Refrigerants - Properties of Ideal Refrigerant

Block-3: Maintenance and Trouble-Shooting of Refrigerator

Unit -5: Care and Maintenance of Refrigerator

Basic Safety Precautions - External parts of a Refrigerator - Installation Process - Refrigerator with water and Ice Dispenser - Care of Refrigerator - Maintenance of Refrigerator - Maintenance of Freezer

Unit -6: Trouble-Shooting of Refrigerator

Technical Safety - Problems of Refrigerator - Trouble shooting the Refrigerator

Block-4: Testing and Servicing of Refrigerator

Unit -7: Basic Electrical Circuits of Automobile

Testing and Replacing of the Refrigerator Parts - Servicing of Refrigerator Parts

Unit -8: Refrigerant Charging and Leakage Tests

Charging of Refrigerant - Effects of Undercharging the Refrigerant Level in a refrigeration equipment - Refrigerant Leak Test

Swami Vivekananda Rural Community College (SVRCC)

Name of the Programme– Vocational Diploma in Refrigeration and AC Technician - Syllabus (Flexible Skill Training Mode)

Course Title	**Air-Conditioner and Air-Conditioning**
Course Code	**VDRA-2**
Course Credit	**4**

Course Objectives

While studying the **Air-Conditioner and Air-Conditioning**, the student shall be able

to:

- Describe the Principle of air-conditioning and the science behind air-conditioning
- Classify the air-conditioning systems and study the various components of the system
- Calculate the energy efficiency of the window and split air-conditioner
- Acquire knowledge about the tools used for copper tubing and installation of AC
- Demonstrate the duct work of AC, servicing and installation of units

Course Outcomes

After completion of the **Course Air-Conditioner and Air-Conditioning**, the student will be able to:

- State the need and application of air-conditioning
- Identify the major control systems of air-conditioner
- Perform Copper tubing operations including brazing
- Installation of widow and split ac, ducting work of central AC
- Perform installation, servicing and maintenance of air-conditioner

Block-1: Science of Air-Conditioning

Unit -1: Basics of Air-conditioning

Introduction - History of Air-Conditioning - Types of System - Need for Air-Conditioning - Application of Air Conditioning - Principles of Air Conditioning

Unit -2: Air-Conditioning Systems

Introduction to Air-conditioning system - Classification of Air-conditioning system - Types of Coolers - Major system components - Major system controls

Block-2: Working of AC and Copper Tubing

Unit -3: Working of AC and Energy Efficiency

Types of Air-Conditioning unit - Energy Efficiency - Energy Labelling Standard for Air-Conditioner - Working of Window Air Conditioner (WAC) - Working of Split Air Conditioner (SAC)

Unit -4: Tubes, Equipments and Copper Tubing Operations

Hand Tools - Equipments and Devices - Copper Tubing - Copper Tubing Operations

Block-3: Installations and Ducting

Unit -5: Installation of Window and Split Air-Conditioner

General Safety for Installation - Installation of Window AC - Installation of Split AC - Post Installation Check-up

Unit -6: Duct Work

Types of Duct Work - Components of Duct Work - Balancing the System - Duct Liner -

Duct Cleaning

Block-4: Servicing and Maintenance of Air-Conditioner

Unit -7: Servicing of Air-Conditioner

Basic servicing operations of Air-conditioner - Avoiding Contaminants - Good service Practices - General Guidelines for Good Service Practices - Recovery, Recycling and Reclamation of Refrigerants - Cleaning of Water cooled Condensers

Unit -8: Safety and Maintenance of Air-Conditioner

Safety and its Importance - Safety while working on Air-conditioners - First Aid for injuries to Technicians - Quality Maintenance of Tools and Equipments - Preventive Maintenance of Room Air-conditioners - Maintenance of Cooling Coil

Swami Vivekananda Rural Community College (SVRCC)

Name of the Programme– Vocational Diploma in Refrigeration and AC Technician - Syllabus (Flexible Skill Training Mode)

Course Title	**Special Cooling Systems**
Course Code	**VDRA-3**
Course Credit	**4**

Course Objectives

While studying the **Special Cooling Systems**, the student shall be able to:

- Enumerate the types of special cooling system and the refrigerant used
- Describe about deep freezers, bottle coolers and display cabinets
- Explain about various refrigerated vehicles and cold storages used for food storage
- Theorize about ice cream freezers, fish freezers and white ice plant

Course Outcomes

After completion of the **Course Special Cooling Systems**, the student will be able to:

- List the various special cooling systems
- Demonstrate the maintenance of deep freezers
- Explain the working of white ice plant
- Detail the application of cold storage and its maintenance

Block-1: Types Of Special Cooling System and Deep Freezers

Unit -1 – Cooling Systems

Introduction - Special Cooling Systems - Refrigerant

Unit -2: Deep Freezers

History of Freezing - Types of Freezers - Basic Feerzerology - Application of Deep Freezer - Maintenance of Freezers

Block-2: Beverage Coolers and Display Cabinets

Unit -3: Bottle Coolers and Chillers

Bottle Coolers and its Types - Components of a Bottle Cooler - Rapid Chillers - Using Rapid Drink Chillers - Blast Chillers - Benefits and Disadvantages of Blast Chillers

Unit -4: Refrigerated Display Cabinets

Display Counters - Multi-deck Refrigerators - Chiller Doors - Care and Maintenance of a Refrigerated Cabinet

Block-3: Cold Storage and Refrigerated Vehicles

Unit -5: Cold Room and Cold Storage

Cold room and its types - Cold storage plant - Working of Cold Storage Plant - Applications of Cold Storage

Unit -6: Transport Refrigeration

Transport Refrigeration Systems - Types of Refrigerated Transport - Refrigerated Containers/ Reefer - Bus Air-Conditioning

Block-4: Consumable Products Freezer

Unit -7: Ice Cream and Fisheries Freezer

Types of Ice Cream Freezers - Freezing Ice Cream - Batch Freezers - Continuous Ice Cream Freezers - Operating the Continuous Freezers - Fisheries Freezers

Unit -8: White Ice Plant

White Ice and its Types - Requirements of Ice Plant - Working Principle - Applications of White Ice