

Workshop on Effective HVAC Maintenance and Troubleshooting

January 26 – 30, 2026, 1st Run: Lagos & Port Harcourt

July 27 – 31, 2026, 2nd Run: Lagos & Abuja

For Tutor -Led Class: 9am – 4:30pm

Workshop fee: N350, 000 per Participant

Abuja / Port Harcourt: N400,000 per participant

Delivery Mode: In-person / Live Virtual / Hybrid

Online course fee: N300, 000 per Participant

Available for In-plant Training

700 U\$D for foreign
Participants

Program overview:

This comprehensive course provides HVAC technicians, facility managers, and maintenance professionals with the knowledge and practical skills required to maintain and troubleshoot HVAC systems effectively. Participants will learn the fundamentals of HVAC system operation, preventive maintenance procedures, and the diagnostic techniques needed to identify and resolve common issues in heating, ventilation, and air conditioning systems.

Throughout the course, participants will explore key concepts such as system performance optimization, energy efficiency, troubleshooting electrical and mechanical components, and understanding control systems. Through hands-on exercises, case studies, and troubleshooting scenarios, participants will develop the confidence and expertise to ensure systems run efficiently, extend their lifespan, and reduce downtime.

For Whom:

The program is designed for HVAC technicians, facility maintenance personnel, building managers, and energy efficiency professionals. Engineers, supervisors, foremen and technicians working in operations and maintenance of HVAC and their accessories to ensure HVAC facilities availability will benefit from this program.

Learning Objectives:

At the end of the program, participants will be able to:

- perform routine maintenance and preventive tasks on HVAC systems;
- identify and troubleshoot common HVAC issues, including electrical faults, refrigerant leaks, and airflow problems;
- use diagnostic tools and techniques to analyze system performance and improve efficiency;
- understand the importance of safety protocols and industry best practices during maintenance and repair; and
- maintain and optimize both residential and commercial HVAC systems, ensuring maximum operational efficiency.

Course outline:

Day 1: Introduction to HVAC Systems and Preventative Maintenance

Overview of HVAC Systems

- Components of HVAC systems: Heating, Ventilation, and Air Conditioning
- Types of HVAC systems (split systems, packaged units, VRF, etc.)
- System cycles (cooling, heating, dehumidifying)

Basic Terminology and Concepts

- Temperature, pressure, airflow, humidity, and how they relate to HVAC performance

Human Capital Associates Global Consult Ltd is Accredited by Nigeria Council for Management Development (NCMD)

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- Refrigerant cycle and its role in HVAC operation

Preventative Maintenance Basics

- Importance of regular maintenance for efficiency, safety, and longevity
- Common maintenance tasks: cleaning filters, checking refrigerant levels, inspecting ductwork, etc.
- Developing a maintenance checklist for HVAC systems

Practical: Hands-On Preventative Maintenance

- Cleaning air filters and coils
- Checking system pressure and refrigerant levels
- Inspecting system components (e.g., fans, condensers, compressors)
- **Class discussion:** Discussion of common mistakes during maintenance, and troubleshooting tips

Day 2: Electrical Systems in HVAC - Diagnostics and Safety

Electrical Fundamentals for HVAC Systems

- Understanding electrical schematics
- Voltage, amperage, and resistance in HVAC components
- Role of electrical components (thermostats, circuit boards, contactors, etc.)

Safety Procedures in HVAC Electrical Work

- Lockout/tagout procedures
- Electrical hazard identification
- Proper PPE (personal protective equipment)

Troubleshooting Electrical Issues

- Diagnosing faults in thermostats, wiring, and circuit boards
- Checking continuity with a multimeter
- Identifying and fixing blown fuses and tripped breakers

Practical: Electrical Diagnostics and Troubleshooting

- Identifying faulty electrical components in an HVAC unit
- Using a multimeter to measure voltage and current
- Wiring a thermostat or contactor
- **Q&A** on electrical troubleshooting and safety procedures

Day 3: Refrigeration Systems - Maintenance and Troubleshooting

Overview of Refrigeration in HVAC Systems

- Principles of refrigeration: how the compressor, condenser, and evaporator work
- Types of refrigerants used in HVAC systems
- Common refrigerant problems (leaks, overcharging, undercharging)

Refrigerant Leaks and Pressure Testing

- How to identify refrigerant leaks (visual inspection, electronic leak detectors)
- Using a pressure gauge for diagnostic purposes
- Evacuating and recharging refrigerant

Troubleshooting Refrigerant Cycle Issues

- Symptoms of low refrigerant and how to detect them
- Diagnosing compressor issues (e.g., overheating, failure to start)

Practical: Refrigerant Troubleshooting

- Performing pressure testing on an HVAC unit
- Using a refrigerant leak detector
- Charging or recharging refrigerant into the system
- Review refrigerant-related issues and practical challenges

Day 4: Airflow and Duct System Troubleshooting

Understanding Airflow and Its Impact on HVAC Performance

- Proper airflow for efficient heating and cooling
- Calculating CFM (Cubic Feet per Minute) requirements for different spaces
- Importance of duct sizing and design in airflow

Ductwork Maintenance and Inspection

- Identifying air leaks, blockages, and dirty ducts
- Techniques for sealing and insulating ducts

Troubleshooting Airflow Problems

- Diagnosing poor airflow and its causes (dirty filters, obstructed ducts, faulty blower)
- Balancing airflow using dampers and adjusting fan speeds

Practical: Airflow Diagnostics and Ductwork Inspection

- Measuring airflow with an anemometer
- Inspecting and cleaning ducts
- Replacing and sealing leaky ducts

Day 5: System Controls and Advanced Troubleshooting

HVAC Control Systems

- Role of thermostats, sensors, and controllers in HVAC operation
- Smart thermostats and advanced control systems
- Understanding control wiring and calibration

Advanced Troubleshooting Methods

- Identifying and solving complex HVAC system failures
- Troubleshooting heating, cooling, and ventilation systems in parallel

Troubleshooting Using Diagnostic Tools

- Using thermal cameras and pressure gauges to diagnose issues
- Advanced diagnostic techniques for complex system failures

Practical: Advanced Troubleshooting

- Applying troubleshooting tools to identify and fix faults in real-time

Training Methodology

Lectures, discussions, practical exercises, case studies, audio-visual aids will be used to reinforce these teaching/learning methods.

LOCATIONS

1 - HCA Learning Centre. Acme House 2nd Floor, 23, Acme Road, Ogbia, Industrial Scheme, Ikeja, Lagos, Nigeria

2 - Pearls Learning Hub, Plot 756, Opposite Divine Hand of God Ministry, Area 1, Garki, Abuja.

3 – Pakiri hotel Ltd., 4 Okwuruola Street, off Stadium Road, Rumuola, Port Harcourt, Rivers State.

Open Course Fee: N350, 000

In-plant Fee Negotiable

WORKSHOP FEE:

N350, 000 per participant, VAT –N26, 250

Abuja / Port Harcourt: N400,000 per participant. VAT-N30,000

Note: this covers Workshop Fee, Tea/coffee break, Lunch, course materials and certificate of attendance.

Payment should be made into our Accounts:

Account Name: Human Capital Associates Global Consult Ltd.

Union Bank of Nig. PLC: Account No: 0097961537

First Bank of Nig. PLC: Account No: 2033683960

Keystone Bank Ltd.: Account No: 1007150325

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