MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

WORKING PRINCIPLES OF AIR CONDITIONING & REFRIGERATION CYCLE

"Mastering Air Conditioning and Refrigeration Systems for Efficient Cooling"

Schedule

Date	Venue	Fees (Face-to-Face)
06 – 10 Sep 2026	Doha, Qatar	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

The Working Principles of Air Conditioning & Refrigeration Cycle course provides participants with a thorough understanding of the operating principles of air conditioning and refrigeration systems. This 5-day intensive training will focus on the physics of refrigeration cycles, key components, and system design, while also offering practical insights into installation, troubleshooting, and maintenance techniques.

The course is designed for engineers, technicians, and professionals working in HVAC, plant maintenance, and refrigeration industries, offering both theoretical knowledge and practical experience to ensure participants are well-equipped to work with these essential systems.

Objectives

By the end of this course, participants will be able to:

- Understand the fundamental principles of air conditioning and refrigeration cycles.
- Identify the key components involved in the refrigeration process, including compressors, condensers, evaporators, and expansion valves.
- Analyze and troubleshoot common issues in air conditioning and refrigeration systems.
- Apply knowledge to optimize performance and efficiency of HVAC systems.
- Understand the environmental impact and energy efficiency of refrigeration cycles.

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Why Attend

- Gain a solid understanding of refrigeration and air conditioning principles.
- Learn how to diagnose and repair common issues in HVAC systems.
- Enhance your ability to design, install, and maintain air conditioning and refrigeration systems.
- Increase operational efficiency through improved troubleshooting and maintenance techniques.
- Network with industry professionals and experts.

Target Audience

This program is designed for:

- HVAC engineers and technicians involved in the design and maintenance of air conditioning and refrigeration systems.
- Plant maintenance professionals responsible for maintaining HVAC systems.
- Mechanical engineers working in industries where refrigeration and cooling systems are essential.
- Students and professionals looking to expand their knowledge in the field of air conditioning and refrigeration.

Individual Benefits

Key competencies that will be developed include:

- Deep understanding of the principles and applications of refrigeration cycles.
- Hands-on experience with the components of air conditioning and refrigeration systems.
- Enhanced troubleshooting skills to resolve HVAC system issues effectively.
- Knowledge of energy-efficient and sustainable refrigeration practices.
- Expertise in system maintenance and optimal performance strategies.

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- The ability to troubleshoot and optimize air conditioning and refrigeration systems.
- Improved maintenance practices leading to reduced downtime and enhanced system reliability.
- The ability to integrate energy-efficient solutions into HVAC system designs.
- Increased overall efficiency and cost-effectiveness in plant and facility management.
- Knowledge of best practices for system installation, operation, and maintenance.

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Introduction to refrigeration cycles and key principles of air conditioning systems.
- Case Studies – Real-world examples of refrigeration system installations and troubleshooting.
- Workshops – Hands-on exercises on system design, maintenance, and troubleshooting.
- Peer Exchange – Group discussions on industry challenges and solutions.
- Tools – Templates and checklists for HVAC system design, installation, and maintenance.

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Refrigeration and Air Conditioning Cycles

- Module 1: Fundamentals of Refrigeration (07:30 – 09:30)
- Introduction to refrigeration principles.
- Overview of the refrigeration cycle and its applications.
- Basic components and their functions: compressor, condenser, evaporator, expansion valve.
- Module 2: Principles of Heat Transfer (09:30 – 11:30)
- Understanding the role of heat transfer in the refrigeration cycle.
- Sensible and latent heat.
- Heat exchangers and their function in air conditioning and refrigeration systems.

Day 2: Refrigeration System Components

- Module 3: The Compressor and Condenser (07:30 – 09:30)
- Function and operation of compressors.
- Types of compressors and their applications.
- Condenser types and working principles.
- Module 4: The Evaporator and Expansion Valve (09:30 – 11:30)
- Understanding the role of the evaporator in the refrigeration cycle.
- Types of evaporators and their operation.
- Expansion valve types and their impact on system performance.

Day 3: Refrigerant Management and Efficiency

- Module 5: Refrigerants: Types and Properties (07:30 – 09:30)
- Different types of refrigerants and their characteristics.
- Environmental impact of refrigerants and regulations.
- Choosing the right refrigerant for specific applications.
- Module 6: System Efficiency and Optimization (09:30 – 11:30)
- Analyzing energy efficiency in air conditioning and refrigeration systems.
- Techniques for optimizing system performance.
- Identifying and mitigating common energy losses.

Day 4: Installation and Maintenance Practices

- Module 7: Installing Air Conditioning & Refrigeration Systems (07:30 – 09:30)
- Best practices for system installation and setup.
- Ensuring proper system sizing and capacity.
- Piping and electrical requirements for HVAC systems.
- Module 8: Preventive Maintenance & Troubleshooting (09:30 – 11:30)
- Developing a maintenance plan for refrigeration systems.
- Common issues in air conditioning and refrigeration systems.
- Troubleshooting techniques and tools for system problems.

Day 5: Advanced Applications and Future Trends

- Module 9: Advanced Refrigeration Systems (07:30 – 09:30)
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High-efficiency refrigeration systems and innovations.

- VRF (Variable Refrigerant Flow) and other modern technologies.
- Application of refrigeration in various industries.
- Module 10: Review and Best Practices (09:30 – 11:30)
- Recap of key learning points.
- Addressing final questions.
- Discussing best practices in air conditioning and refrigeration.

Certification

Participants will receive a Certificate of Completion in Air Conditioning & Refrigeration Cycle Principles, recognizing their expertise in HVAC system principles, installation, maintenance, and troubleshooting practices.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**