Industrial Refrigeration Systems Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Industrial Refrigeration Systems Training Course is designed to equip technicians, engineers, and facility managers with advanced skills in industrial cooling systems, ammonia refrigeration, HVAC-R technology, energy-efficient cooling solutions, and cold chain infrastructure management. With the rapid expansion of food processing plants, pharmaceutical storage, logistics cold rooms, and large-scale manufacturing facilities, demand for skilled professionals in industrial refrigeration maintenance, compressor systems, refrigeration cycle optimization, and thermal energy management continues to grow globally. This course delivers hands-on technical expertise combined with modern industrial standards such as ISO refrigeration safety compliance, predictive maintenance, and green cooling technologies.

The training focuses on real-world industrial applications including ammonia (NH?) systems, CO? refrigeration systems, glycol chillers, cascade refrigeration systems, and centralized cold storage plants. Learners gain deep understanding of system design, fault diagnosis, energy optimization, and operational efficiency improvements. The program is structured to support both entry-level technicians and experienced professionals seeking certification in advanced refrigeration engineering, industrial plant reliability, and smart HVAC automation systems, ensuring readiness for high-demand roles in manufacturing plants, petrochemical industries, and cold chain logistics operations.

Programme Curriculum

Industrial Refrigeration Systems Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of industrial refrigeration cycles and thermodynamics
2. Operate and maintain ammonia and CO? refrigeration systems
3. Perform compressor diagnostics and troubleshooting techniques
4. Apply energy efficiency optimization strategies in cooling plants
5. Implement preventive and predictive maintenance systems
6. Master cold storage design and temperature control systems
7. Identify and resolve refrigerant leakage and safety hazards
8. Interpret P&ID diagrams and refrigeration schematics
9. Configure PLC-based refrigeration control systems
10. Ensure compliance with ASHRAE, ISO, and safety regulations
11. Optimize industrial HVAC-R performance and load management
12. Conduct system commissioning and startup procedures
13. Develop skills in fault analysis and system reliability engineering

Target Audience

1. Industrial refrigeration technicians
2. HVAC-R engineers and apprentices
3. Cold storage facility operators
4. Maintenance supervisors in manufacturing plants
5. Food processing plant engineers
6. Pharmaceutical cold chain professionals
7. Energy and utility management engineers
8. Technical college and engineering students

Course Modules

Module 1: Fundamentals of Industrial Refrigeration Systems

- Refrigeration cycle principles and thermodynamics
- Heat transfer mechanisms in industrial systems
- Types of refrigeration systems

- Refrigerants and environmental impact
- Industrial applications overview
- **Case Study:** Analysis of refrigeration failure in a food processing cold room due to improper heat load calculation.

Module 2: Ammonia (NH?) Refrigeration Systems

- Properties and safety handling of ammonia
- System components and design architecture
- Compressor and evaporator configurations
- Leak detection and emergency response
- Industrial ammonia plant operations
- **Case Study:** Ammonia leak incident response and containment in a meat processing facility.

Module 3: CO? and Eco-Friendly Refrigeration Systems

- Transcritical CO? system operations
- Environmental compliance and green cooling
- System efficiency in high ambient conditions
- Cascade system integration
- Low-carbon refrigeration technologies
- **Case Study:** Transition from HFC system to CO? refrigeration in a supermarket cold chain network.

Module 4: Compressors and Mechanical Systems

- Reciprocating, screw, and scroll compressors
- Lubrication systems and oil management
- Performance testing and diagnostics
- Vibration analysis and wear detection
- Compressor efficiency optimization
- **Case Study:** Screw compressor failure due to oil contamination in a dairy processing plant.

Module 5: Refrigeration Controls and Automation

- PLC-based control systems
- Sensors, actuators, and control logic
- SCADA integration in refrigeration plants
- Temperature and pressure regulation systems
- Fault alarms and automation troubleshooting
- **Case Study:** PLC malfunction causing temperature deviation in pharmaceutical cold storage.

Module 6: Cold Storage Design and Operation

- Cold room design principles
- Load calculation and insulation systems
- Airflow management and zoning
- Evaporator selection and placement
- Operational efficiency strategies
- **Case Study:** Energy loss analysis in a warehouse cold storage due to poor insulation design.

Module 7: Maintenance, Fault Diagnosis & Reliability

- Preventive and predictive maintenance systems
- Root cause analysis techniques
- Common refrigeration faults and fixes
- Condition monitoring tools
- Reliability-centered maintenance (RCM)
- **Case Study:** Repeated compressor shutdowns in a beverage plant due to unnoticed pressure imbalance.

Module 8: Safety Standards and Industrial Compliance

- Refrigeration safety protocols
- Pressure vessel regulations
- ASHRAE and ISO compliance standards
- Emergency shutdown procedures
- Environmental and workplace safety
- **Case Study:** Safety audit failure in industrial refrigeration plant leading to regulatory shutdown.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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