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COURSE BROCHURE

# HVAC Design, Operation and Maintenance for Buildings Training Course

# HVAC Design, Operation and Maintenance for Buildings Training Course

HVAC Design, Operation and Maintenance for Buildings is a 1-week training course for facilities engineers, HVAC technicians and building services managers who keep offices, hospitals, malls and campuses cool, ventilated and healthy, and who leave with an HVAC maintenance and performance plan for one building. Cooling now dominates building energy bills in hot climates, and occupants notice every failed chiller or stuffy floor. Jupiter Prime Training runs this course in HVAC design, operation and maintenance for buildings.

## Why HVAC Design, Operation and Maintenance for Buildings Matters Now

Rising cooling loads, energy and carbon targets set by building owners, and tenants who expect steady comfort and clean indoor air all press on the building services team. A building whose air handling units run with clogged coils and unbalanced ducts burns energy, triggers comfort complaints and shortens compressor life; one whose systems are sized correctly, tuned and maintained on a planned cycle stays comfortable at lower running cost. The course links HVAC upkeep to ISO 55001 for asset management systems and EN 13306 for maintenance terminology, so chillers and fans are treated as managed assets with defined maintenance tasks.

## Who Gains Most from HVAC Design, Operation and Maintenance for Buildings

- Facilities engineers responsible for chilled water plant, air handling units and terminal units
- HVAC technicians who carry out coil cleaning, filter changes, refrigerant checks and fault-finding
- Building services managers accountable for comfort, energy use and maintenance contracts
- Commissioning and handover engineers who accept new or refitted HVAC systems
- Energy officers who track cooling consumption and set operating schedules

A facilities group running several buildings gains most when its engineers and lead technicians attend together, because design intent, control settings and maintenance tasks then follow one shared understanding of each system.

## HVAC Design, Operation and Maintenance for Buildings Capabilities

Participants trace how heat enters a building, how the plant removes it and where neglect wastes cooling and comfort.

- Calculate sensible and latent cooling loads for typical zones — equipment sizing and retrofit choices
- Weigh split, packaged, VRF and chilled water systems — system selection for new or refitted floors
- Assess air distribution, duct leakage and balancing results — occupant comfort complaints
- Apply chiller and AHU operating sequences and set points — energy and comfort trade-offs
- Design planned maintenance task lists and frequencies for HVAC plant — contractor scope and budgets
- Build performance indicators for kW per tonne, uptime and indoor air — reports to building owners

## Key HVAC Design, Operation and Maintenance for Buildings Terms

- Cooling Load — the rate of heat that must be removed from a space to hold its design temperature and humidity.
- Sensible and Latent Heat — heat that changes air temperature, and heat tied to moisture that must be removed by condensing it.
- Air Handling Unit AHU — a cabinet of fans, coils, filters and dampers that conditions and moves air to building zones.
- Chilled Water Delta T — the temperature difference between supply and return chilled water, a key sign of plant efficiency.
- Air Balancing — adjusting dampers and fan speeds so each outlet delivers its design airflow.
- kW per Tonne — electrical input per unit of cooling delivered, used to compare chiller plant efficiency.

## HVAC Design, Operation and Maintenance for Buildings Day by Day

### Day 1: Heat, Comfort and Building Loads

- Psychrometric Chart Reading — Temperature, Humidity and Comfort Zones
- Cooling Load Calculation Method — Solar, Occupancy, Lighting and Equipment Gains
- Ventilation and Fresh Air Rates — Indoor Air Quality Versus Energy
- Building Zoning Layout — Grouping Spaces by Use and Orientation
- Design Brief Review — Checking Original Sizing Against Current Use

### Day 2: System Selection and Air Distribution

- Split, Packaged and VRF System Comparison — Fit for Floor Area and Use
- Chilled Water Plant Configurations — Primary, Secondary and Variable Flow
- Duct Sizing and Leakage Testing — Delivering Air to Every Zone
- Diffuser and Grille Selection — Throw, Noise and Draught Control
- Air Balancing Procedure — Matching Measured to Design Airflow

## Day 3: Operating Chillers, AHUs and Controls

- Chiller Start-Up and Sequencing — Staging Units Against Building Demand
- AHU Operating Sequence — Economy Cycle, Dehumidification and Reheat
- Building Management System Set Points — Schedules, Resets and Alarms
- Cooling Tower and Condenser Water Care — Scale, Drift and Water Treatment
- Refrigerant Handling and Leak Checks — Safe Practice and Plant Efficiency

## Day 4: Planned Maintenance and Fault-Finding

- Planned Maintenance Task Library — Coils, Filters, Belts, Bearings and Drains
- Condition Checks for Fans and Compressors — Vibration, Current and Temperature
- Common Fault Diagnosis — Low Airflow, High Head Pressure and Icing
- Maintenance Contract Scope — Full Parts-and-Labour Cover Versus Labour-Only Terms
- Performance Indicators — kW per Tonne, Delta T and Comfort Complaints

## Day 5: Practising the HVAC Maintenance and Performance Plan

- Load and Zoning Check for a Chosen Building — Applying Day One Methods
- Air Distribution Survey Findings — Applying Balancing and Leakage Tests
- Plant Operating Settings Review — Applying Sequencing and Set-Point Tuning
- Task List and Frequency Schedule — Applying the Planned Maintenance Library
- HVAC Maintenance and Performance Plan — Completed Document for Building Owners

## Applying HVAC Design, Operation and Maintenance for Buildings After the Course

- Log chilled water delta T and kW per tonne for four weeks and compare the readings with design values.
- Run an air balancing check on the floor with the most comfort complaints and record each outlet against design airflow.

## HVAC Design, Operation and Maintenance for Buildings Questions FAQ

### What is HVAC design, operation and maintenance for buildings and why does it matter now?

HVAC design, operation and maintenance for buildings covers sizing, running and caring for heating, ventilation and cooling systems. It matters now because cooling drives energy bills and occupants expect steady comfort and clean air.

### Which roles gain most from HVAC design, operation and maintenance for buildings training?

Facilities engineers, HVAC technicians, building services managers, commissioning engineers and energy officers gain most. They size, run, tune and maintain the plant and answer for comfort and running cost.

## How does HVAC design, operation and maintenance for buildings differ from an industrial HVAC design course?

HVAC design, operation and maintenance for buildings centres on offices, hospitals, malls and campuses, with strong weight on operation and planned maintenance. Industrial HVAC design courses address hazardous areas, pressurisation and process cooling in plants.

## What do you bring back from HVAC design, operation and maintenance for buildings training?

You bring back a maintenance and performance plan for one building, with load checks, air distribution findings, tuned operating settings, task frequencies and indicators to report to the owner.

## HVAC Design, Operation and Maintenance for Buildings: The Way Forward

The HVAC maintenance and performance plan first informs next season's maintenance contract scope and set-point changes. Facilities engineers and technicians use it to schedule tasks and report plant efficiency to building owners. After a full cooling season, revisit the load and zoning check, because changes in occupancy and tenant fit-out often shift where the plant struggles.