

MECHANICAL (HVAC) DESIGN with AutoCAD MEP

WHO IS THIS COURSE FOR:

- ❖ Mechanical engineers and technologists
- ❖ Mechanical engineering graduating students
- ❖ HVAC designers
- ❖ Mechanical Draftsman
- ❖ Usual HVAC designers that need to adopt AutoCAD MEP.

HOW LONG IS THE COURSE?

The course is prepared into two parts:

1. Indoor training

This will be taking 2 months that are purposed to heighten your capability of using a dedicated software in building services design, three days a week (evening and weekend only).

2. Project study

After the indoor training, you will be given a realistic project study to deliver within 1 month that may be extended.

You have to present the progress to the supervisor once a week till you completely deliver it.

WHO TEACHES THIS COURSE?

The trainer of this course must be an AutoCAD MEP professional, Approved by Autodesk. Find the appointed trainer(s) of this course by clicking the following link <http://nzizatrainng.ac.rw/trainers/>

COURSE OBJECTIVE:

This course takes you on the complete steps in your learning journey, teaching you the fundamental skills you need to start designing building services (HVAC) using AutoCAD MEP with accuracy and precision. Project success also depends on solid documentation you will discover the best-practice workflows to use in AutoCAD MEP.

This course will cover the development of drawings of HVAC design according to the ASHRAE standard code. Practice your new skills and test your knowledge with the exercises, challenge assignments, and a final project study that go with the course.

WHAT WILL BE THE OUTCOME?

The course lessons are project-oriented to enable you excellently start, work on and finalize any HVAC design project from Conception through detailing and estimation to documentation.

This course is also authorized by Autodesk, it means that the successful participants will be certified by Autodesk's world headquarter.

COURSE CONTENT

NOTE: It can be updated anytime to match market needs

Week 1: Introduction to AutoCAD MEP and Course overview

- AutoCAD MEP installation and overview
- Understanding MEP toolset
- Course curriculum Understanding
- Understanding the objectives of the course

Week 2: Introduction to HVAC

- What is HVAC?
- Modes of heat transfer
- Refrigeration systems
- Understanding Sensible Heat, Latent Heat and Enthalpy
- Understanding and Using Psychometric charts in HVAC design
- Standards and codes used in HVAC

Week 3: Types of air conditioning systems and equipment

- Split (ductless) A/C
- Ducts and Centralized A/C
- Packaged units
- Variable refrigerants volume (VRV)/ Variable refrigerant flow (VRF)
- Rooftop units
- Air Handling Units and Fresh Air Handling Units (AHU & FAHU)

Week 4: Thermal comfort and heating & cooling load calculations

- Comfort Parameters
- Understanding Indoor & Outdoor Design Conditions

- Cooling load calculation methods
- Sources of Heat Gain
- External: Heat Gain through Glass/Window, Heat Gain through Roof/Wall/ Wall Partition gain
- Internal: Heat Gain through People, Lights, Electrical Equipment, Motors, and Kitchen Appliances
- Heat gain through Ventilation and Infiltration
- ESHF, ADP & Air Flow Rate (CFM) Calculation

Week 5: Air distribution Systems- Ducting and Air terminals With AutoCAD MEP

- Duct-Definition & Terminology
- Types of Ducts, Duct Fittings, Dampers, Flexible ducts
- Classification of Duct (Low, Medium & High pressure)
- Type of Duct Materials, Calculation of total sheet required for Duct Fabrication &
- Ducts Sizing
- Selection of Grills and Diffusers
 - Duct designing methods (Manually)
 - Velocity reduction method.
- Equal friction Method.
- Static regain method
- Fan selection & ESP calculation.
- Components of Air Distribution System
- Concept of CAV & VAV

Week 6: Design of Ventilation systems

- Fresh Air Handling Unit Designing as per ASHRAE 62.1
- Restaurant/Residence kitchen ventilation system designing as per ASHRAE 90.1
- Non-Central and Central Toilet Exhaust Calculations as per ASHRAE 62.1
- Car Parking Ventilation System Designing

Week 7: Chillers systems

- Various types of Chillers
- Water chilled systems components

- Chilled water pipe sizing
- Typical Installation of Chilled water FCU and AHU
- Valves and accessories used in Chilled water system

Week 8: Project Documentation-Estimation and Costing

- Understanding the tendering requirements
- Quantity take-off and BOQ preparation
- Preparing inquiries for Suppliers, RFQs & Finalizing the suppliers.
- Types of approval
- Preparation of BOQ and design documents
- Specifications

Week 9-Week 12: Final Project study and Implementation