COURSE ID :- AM 2 - HVAC DESIGNING & DRAFTING COURSE
COURSE CONTENT

Introduction: Introduction, basics, units, conversions | Scope of HVAC | Future of MEP and HVAC | Applications of HVAC | Standards in HVAC (ASRAE, ISHRAE, DW144, DW142, SMACNA) | Introduction to air conditioning | Types of Airconditioning systems | Feasibility study | HVAC Drawings | Roles & responsibilities of HVAC engineers | Detailed discussion of HVAC design | Introduction to HVAC installation | Introduction to HVAC maintenance | Introduction to HVAC Testing and Commissioning

Basics, Units: Definition of Heat | Temperature & Conversions | Tonne of refrigeration (TR) & Btu/hr | Coefficient of performance (COP) | Energy efficiency ratio (EER, ISEER) | Modes of heat transfer | Saturation point concept | Latent heat of Evaporation & Latent heat of fusion | Enthalpy / Total heat | Sensible and latent heat | Vapour compression refrigeration cycle | Types of Refrigerants | Units - Metric and Imperial Units | Conversions

Psychrometry: Introduction, uses and applications of psychrometry | Properties of air | Dry and Moist air | Dry bulb temperature (DBT) | Wet bulb temperature (WBT) | Dew point temperature (DPT) | Apparatus Dew point temperature (ADP) | Humidity ratio / Specific humidity | Relative humidity | Specific volume | Psychrometric chart study | Psychometric software | Psychometric analysis | Cooling & Heating calculations using chart | Humidification & Dehumidification | Sensible heat factor | Bypass factor & Contact factor | Allignment circle | Designs using Psychrometric chart | Fresh air handling unit (FAHU) sizing using psychrometric chart

Machines: Types of Air conditioning systems | Comfort air conditioning systems | Industrial air conditioning systems | Precision conditioning systems | Direct expansion machines | Split airconditioning machine | Wall mounted split AC | Floor mounted split AC | Ceiling mounted split AC (Cassette) | Ducted split AC | Multi split AC | Inverter AC | Difference between Split and Inverter AC | Inverter AC with Dual compressor | Unitary Systems | Window airconditioning systems | Packaged AC | VRV/VRF Systems | DX AHU / DX FAHU | Chilled beams concept | Radiant cooling concept | Wrist cooling concept | Vortex chiller concept | Peltier cooling concept | District cooling systems | Desert cooler | Air cooled chiller | Water cooled chiller | Cooling tower | Fancoil units (FCU) | Air handling unit (AHU) | Fresh air handling unit (FAHU) | Heat recovery unit (HRU) | Ventilation & Exhaust fans | Ecology unit | Electro static precipitator | Inline ducted exhaust fan | Car parking exhaust fan | Smoke exhaust fan | Stairwell pressurization fan | Lobby pressurization fan | Garbage chute exhaust fan | Kitchen exhaust fan | Air curtain | Constant air volume (CAV) system | Variable air volume (VAV) system | Single zone systems | Multi zone systems

Heating and Cooling Load Calculation: Gathering data | Drawings required for analysis | Ambient and Design conditions | Latitude and Longitude | Building Directions | Land elevation w.r.t sea level | Building sectional/elevation details | Ventilation requirement as per (ASHRAE 62) | Gathering U values | Load from overhead Lights & Task lights | Load from electrical equipments | Load from people | Load from Walls & roof | Load from windows & skylight | Load from Ceiling and floors | Load from Infiltration and Ventilation | Load from Partitions | Cooling load calculation | Heating load calculation | Manual load calculation | Load calculation using E20 sheet | Load calculation using HAP Software | Creating systems and schedules | Generating report | Understanding report | Project: Multistorey abroad BANK building

Duct System: Classification of duct | Material using for duct construction | Duct construction standards (SMACNA, DW) | Duct gauge & thickness selection | Duct aspect ratio | Acoustic criteria for duct | Velocity limitation for ducting | NC values for Velocity selection | Duct thermal insulation | Duct acoustic insulation | Duct Designing: Equal friction method, Velocity reduction method, Static regain method, Manual method, ASHRAE Chart method, Software method | Duct nomenclature: Supply Air Duct, Return Air Duct, Makeup air duct, Fresh Air Duct, Kitchen exhaust Duct, Smoke exhaust Duct, Toilet exhaust Duct, Stairwell pressurization duct, Generator exhaust duct, Garbage chute duct, Carpark exhaust duct, Lobby pressurization duct | Duct accessories: Volume Control Damper, Variable Air Volume, Butterfly Damper, Motorized Volume Control Damper, Fire damper, Motorized Fire Damper, Motorized smoke Fire Damper, Non-Return Damper, Sound Attenuators, Splitter damper | Project training in duct sizing

Machine Selection: Factors affecting machine selection | Selection criteria of All Air conditioning Machines | Specified data | Proposed data | Selecting machine as per ambient temperature | Machine selection using Technical data sheet

Space Air Distribution: Primary air, Room air, Total air | Comfort criteria | Draft Concept | Terminal velocity concept to prevent draft (T50) | Throw, drop, Spread | Noise criteria (NC) values | Permissible delivery velocities | Characteristic length of air terminals | Types of air terminals: Square diffuser, Round diffuser, Grilles, Linear bar grille, Linear slot diffuser, Jet / Nozzle diffuser, Displacement diffuser, Disc valve, Perforated diffuser, Egg crate grille, Fabric diffuser, Louvers, Fresh air louver, Exhaust louvers, Sand trap louvers | Pressure drop in air terminals | Air terminal design & selection | Project training in air terminal selection

Fan Selection: Total pressure, static pressure, dynamic pressure | Internal static pressure (ISP) | External static pressure (ESP) calculation using Excel sheet | External static pressure (ESP) calculation using ASHRAE Software | Fan performance | Types of Fan | Acoustic characteristics | Fan power calculation | Fan selection | Project training in ESP Calculation and Fan selection

Ventilation: Toilet exhaust system | Toilet makeup air system | Kitchen exhaust system | Kitchen makeup air system | Car parking exhaust system | Car parking makeup air system | Generator room exhaust system | Commercial kitchen hood design and selection | Ecology unit selection | Building fresh air system | Building makeup air system | Negative and positive pressure regions in buildings | Stairwell pressurization | Smoke exhaust system | Lobby pressurization | Building pressurization | Project training in Ventilation

Chilled Water System: Introduction to chilled water system | Chilled water pipe materials | ERW and Seamless pipes | Pipe class | Pipe schedule | Chilled water circuits: Constant flow primary only system, Primary secondary system, Variable primary system, Primary secondary tertiary system, Direct return system, Reverse return system | Chilled water pipe sizing method: Friction method, Velocity method, Friction Velocity combined method, Manual method, ASHRAE chart method, Software method | Condensate drain pump selection | Condensate drain pipe sizing (CDP) | Condensate drain pipe slope selection | Drain trap sizing for condensate line | Chilled water Valves and fittings: Valve package for FCU, AHU, FAHU, Chiller, Pumps, Cooling tower, 2 way motorized valve, 3 way motorized valve, Double regulating balancing valve (FO DRV, VO DRV), Pressure independent control valve (PICV), Strainer, Orifice plate, Pressure gauge, differential pressure gauge, test points | Low DeltaT Syndrome | Chiller Surge | Troubleshooting of Chiller, Pumps, Cooling tower | Project training in Chilled water pipe sizing

Pump Selection: Types of pumps | Primary, Secondary, Tertiary pump selection | Heat and Cool pump selection | Pump flowrate calculation | Pump head calculation manually and using software | Pump power calculation | Net positive suction head (NPSHr) Calculation | Pump curves | Variable frequency drive (VFD / VSD) | Pump selection using Head Vs Discharge Curve | Project training in Pump Design & selection

Cooling Tower: Types of cooling towers: Natural, Forced, Induced draft cooling towers | Cooling tower drift eliminators | Cooling tower design and Selection | Cooling tower pump selection | Evaporation, Drift and COC losses of cooling tower | Cooling tower makeup water calculation | Chilled water expansion vessel design and selection | Chilled water buffer tank design and selection | Chilled water chemical flushing | Project training in Cooling tower design & selection | Project training in expansion vessel design & selection | Equalizer line

District Cooling, Heat Exchangers, Thermal Storage Tank: District cooling system, Heat exchanger selection, Thermal storage calculations | Plate heat exchangers (PHE), design, pump selection | Project: Heat exchanger design and selection

Cleanrooms, Cold Storage: Cleanroom ISO, FEDERAL standards, HEPA/ULPA filters | Filter Selection, design Calculations | Equipments arrangement

Filters,Acoustics,Insulation: Type of air filters used in HVAC air side equipment, MERV rating of filters, HEPA and ULPA filters, Filter selection Insulation: Types of thermal and acoustic insulation materials, Insulation selection, Acoustic insulation design and selection Acoustics: Sound attenuator design and selection Project training

Drafting - AutoCAD: Learning AutoCAD, Introduction to AutoCAD, AutoCAD interface, Coordinates, Angle measurement system, Unit system (SI, IPS), Keyboard shortcuts, Command customization, Draw tools (Line, Polyline, Construction line, Spline, Multiline, Circle, Rectangle, Ellipse, Polygon, Arc, Point, Revision Cloud), Modify tools (Copy, Move, Rotate, Offset, Mirror, Scale, Block, Explode, Stretch, Join, Break, Align, Fillet, Chamfer, Trim, Extend, Reverse, Point, Divide, Zoom), Object properties (Line width, Line style, Dimensions, Dimension style), Single line & Multiline text, Layers, Laywalk, Purge, Xref, Etransmit, Audit, Layouts, Page setup manager, Printing & Plotting

Drafting - Preparing Layouts: Template selection, Setting units, Attaching Xref file, Creating HVAC layers, Inserting HVAC blocks, Allowance calculation as per site and ceiling, Placing HVAC equipment, Placing air terminals, Single line routing of supply ductwork, Single line routing of return ductwork, Making single line to 2D HVAC layout, Creating and inserting duct fittings and accessories, Thermal insulation, Acoustic insulation, Single line routing of chilled water pipework, Making single line to 2D chilled water pipework, Chilled water valves and accessories connection, HVAC ventilation drawings, Drawing legends and notes, HVAC riser diagram, Isometric drawings, Tender drawing preparation, IFC/GFC drawing preparation, Working/Shop drawing preparation, As-built drawing preparation, Coordination, Purging, Binding Xref, Etransmit, Finding optimum sheet size for drawing, Layouts, Page setup manager, Title sheets, Viewports, Setting sheet and scaling, Pen assignments, Drawing submission, Taking printouts

Final Project (Implementing complete course study)

Softwares & Tools: HAP - Heating and cooling load calculation, E20 SHEET - Cooling load calculation, MCQUAY DUCT SIZER - Duct sizing, MCQUAY PIPE SIZER - Chilled water pipe sizing, ASHRAE DUCT FITTINGS DATABASE - ESP calculation, AIRMASTER - Air terminal selection, MS EXCEL - ESP calculation, Pump head calculation, AutoCAD - Drafting

COURSE ID :- AM 3 - ELECTRICAL DESIGNING & DRAFTING, ESTIMATION COURSE CONTENT
COURSE CONTENT

ELECTRICAL BASICS, UNITS AND STANDARDS

Introduction to Course and Using Standards:
Overview of the course structure and objectives.
Introduction to international and regional standards including IEC (International Electrotechnical Commission), NEC (National Electrical Code), NBC (National Building Code), and DEWA (Dubai Electricity and Water Authority).
Duties and Role of an Electrical Design Engineer and Draughtsman:
Understanding the responsibilities and tasks of an electrical design engineer.
Role and importance of a draughtsman in electrical projects.
Basic Terms and Parameters in Electrical:
Definitions and explanations of fundamental electrical terms.
Key electrical parameters and their significance.
Electrical Generation, Transmission and Distribution:
Overview of the electrical power generation process.
Methods of power transmission and distribution.
Key components involved in each stage.
Circuits and Standards:
Different types of electrical circuits.
Relevant standards and regulations governing electrical circuits.
Load Current Calculation:
Methods for calculating load current.
Importance of accurate load current calculation in design.
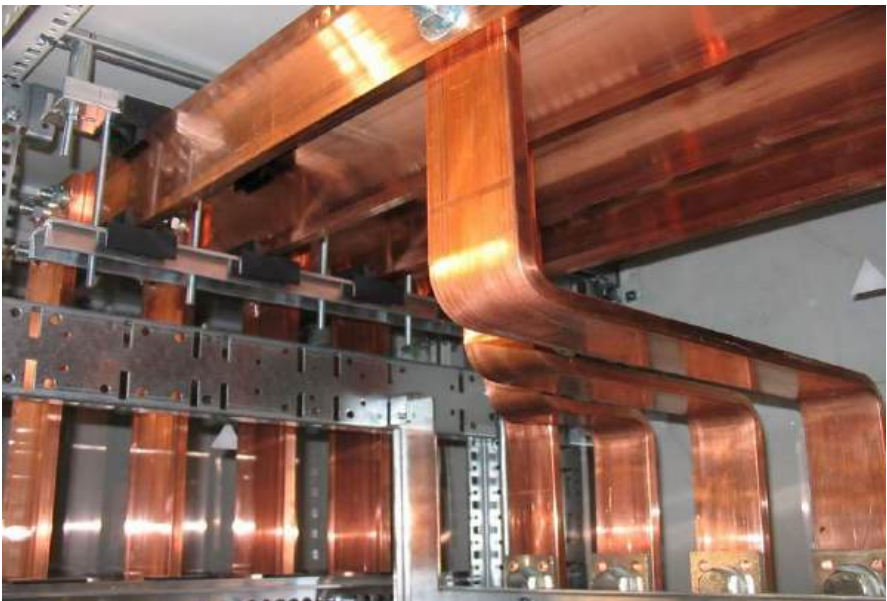**Wiring Concepts:**
Basics of house wiring.
Key components and layout considerations.
Symbols, Abbreviations, and Legends:
Standard symbols used in electrical drawings.
Common abbreviations and their meanings.
Importance of legends in interpreting electrical diagrams.

LIGHTING SYSTEM
Photometric Terms and Equations:
Key photometric terms such as luminous flux, luminous intensity, illuminance, and luminance.
Equations used in lighting design calculations.

Different Types of Lighting:
Overview of various lighting types (e.g., ambient, task, accent).
Applications and characteristics of each type.
Different Types of Lamps and Luminaires:
Types of lamps (incandescent, fluorescent, LED, etc.).
Types of luminaires and their applications.
Lux Level Calculation:
Methods for calculating required lux levels.
Standards and guidelines for different spaces.
Lighting Design and Simulation Using Relux:
Introduction to Relux software.
Step-by-step guide to designing and simulating lighting.
Inserting CAD Plan to Relux & Exporting Result to AutoCAD:
Importing CAD plans into Relux.
Exporting simulation results back to AutoCAD for further use.

POWER DISTRIBUTION

DB Sizing:
Determining the size of distribution boards (DB).
Factors influencing DB sizing.
DB Schedule & Load Balancing:
Creating a DB schedule.
Techniques for load balancing across circuits.
Study and Selection of Cables:
Types of cables, conductors, strands, cores, and insulation.
Criteria for selecting appropriate cables.
Voltage Drop Calculation:
Methods for calculating voltage drop in circuits.
Importance of maintaining voltage levels.
Cable Schedule and Conduit Selection as per Standards:
Preparing a comprehensive cable schedule.
Selecting conduits based on standards and requirements.
Cable Tray, Raceway, Trunking, Conduits and Routing:
Types and applications of cable trays, raceways, trunking, and conduits.
Best practices for routing cables.
Circuit Breakers Types and Selection:
Overview of different types of circuit breakers.
Criteria for selecting appropriate circuit breakers.
Panel Boards Design and Selection:
Designing panel boards including MDB (Main Distribution Board), SMDB (Sub-Main Distribution Board), and DB.
Selection criteria for panel boards.
Transformer Details and Sizing:
Key aspects of transformer design.
Methods for sizing transformers.
Selection of UPS, Inverter, and Generators:
Criteria for selecting UPS systems, inverters, and generators.
Understanding their roles in power continuity.
Battery Bank Sizing:
Calculating the required size for battery banks.
Key factors influencing battery bank design.
Protection of Transformers:
Methods and devices used to protect transformers.
Importance of transformer protection in electrical systems.
Instrument Transformers (CT, PT, NCT):
Overview of current transformers (CT), potential transformers (PT), and neutral current transformers (NCT).
Applications and selection criteria.
Fault Level and Short Circuit Calculations:
Methods for calculating fault levels and short circuit currents.
Importance in ensuring safety and reliability.
Capacitor and Capacitor Bank Sizing:
Calculating the size of capacitors and capacitor banks.
Role in power factor correction.
APFC Panel:
Design and selection of Automatic Power Factor Correction (APFC) panels.
Applications and benefits.
Busbar, SFU Details and Selection:
Understanding busbar design and selection.
Overview of Switch Fuse Units (SFU) and their applications.
Motors and Design of Motor Control Centre:
Basics of motor types and applications.
Designing a Motor Control Centre (MCC).

Single Line Diagram (SLD) for Different Types of Buildings:
Creating and interpreting Single Line Diagrams.
Importance of SLDs in electrical design.
Earthing:
Importance of earthing in electrical systems.
Methods and standards for effective earthing.
Lightning Protection & Arresters:
Designing lightning protection systems.
Selection and placement of lightning arresters.

SOLAR SYSTEM CONCEPT AND DESIGN

Solar Cell:
Basics of solar cell technology.
Types and characteristics of solar cells.
Off Grid and On Grid Solar System:
Differences between off-grid and on-grid solar systems.
Applications and design considerations.
Design of Solar Panels & Inverter:
Calculating the number of solar panels required.
Selecting and sizing inverters.

OTHER SERVICES IN BUILDINGS

Fire Alarm System:
Designing and implementing fire alarm systems.
Key components and standards.
Emergency Lighting:
Design considerations for emergency lighting.
Standards and guidelines for placement and maintenance.
Close Circuit Television (CCTV):
Types of CCTV cameras and their applications.
Designing a CCTV system and circuiting.
Public Addressing System (Speakers Selection):
Designing public addressing systems.
Selecting appropriate speakers for different environments.
Telephone and Data Systems:
Designing telephone and data network systems.
Key components and layout considerations.

DRAFTING

Electrical Drawings (AutoCAD, Revit):
Creating and interpreting electrical drawings.
Using AutoCAD and Revit for drafting electrical layouts.
Lighting Layout:
Designing and drafting lighting layouts.
Small Power and Data Layout:
Creating layouts for small power and data systems.
Fire Alarm Layout:
Drafting fire alarm system layouts.
Emergency Lighting Layout:
Designing and drafting emergency lighting layouts.

Training Project (On Job):
Applying learned skills to real-world projects.
Practical training and hands-on experience.

SOFTWARES & TOOLS
RELUX/DIALux - Lighting Design and Simulation:
MS Excel - Tray Selection, Solar System, Load Distribution Schedule:
AutoCAD - Drafting:
ETAP - SLD Creation, Voltage Drop Calculation and Short Circuit Analysis:

COURSE ID :- AM 4 - PART 1 - PLUMBING DESIGNING & DRAFING
COURSE CONTENT

Introduction & Basics:
Introduction, basics, units, conversions
Scope & Future of MEP
Applications of plumbing
Standards in plumbing (IPC, UPC, NBC, ASPE, DEWA)
Introduction to plumbing systems

Type of plumbing systems
Plumbing drawings
Roles & responsibilities of plumbing engineers

Items in Drainage & Water Supply:
Plumbing items and fixtures
Number of fixtures inside spaces as per IPC
All fixtures in bathrooms and toilets
All accessories in bathrooms and toilets
All equipments in bathrooms and toilets
All traps and wastes in plumbing systems
Water closets, lavatories, urinals, bidet, shower tray
Kitchen sink, service sink, janitor sink
Bath tubs, jetted and air bath tubs
Jetted and air bath tub accessories
Bibcock, mixers, thermostatic mixing valves
Floor traps, floor drains, floor cleanouts, roding eye, cleaning eye
Parking drains, channel gratings, shower gratings, balcony drains
P trap, U trap, Nanu trap, bottle trap, sediment bucket
Click clack waste, popup waste
Pipe hangers and supports
Grease / oil interceptors
Rainwater outlets and spouts
Valves in plumbing systems
Fittings and accessories in plumbing systems

Water Supply, Drainage Design:
Types of water closets flushing systems
Plumbing equations, calculations and system design
Pressure requirements in plumbing systems as per IPC
Selection and location of pressure regulating valves (PRV)
Water demand calculation, drainage flow calculations
Water supply underground tank/reservoir sizing
Water supply overhead tank/reservoir sizing
Drainage underground tank/reservoir sizing
Septic tank sizing
Soak pit sizing
Sump pit and Sump pump
Sewage lifting tank sizing
Hot water demand calculation
Hot water system calculations
Centralized hot water system design
Water supply in buildings (gravity systems and boosted systems)
Water supply and drainage fixture units for design
Water supply pipe sizing as per flow rate (IPC)
Water supply pipe sizing as per fixture units (IPC)
Isometric layout making
Gravity water supply system design and pipe sizing - manually and using software
Booster water supply system design and pipe sizing - manually and using software
Hot water supply system design and pipe sizing - manually and using software
One pipe drainage systems
One pipe partially ventilated drainage systems
Two pipe drainage systems
Single stack/double stack drainage systems
Horizontal drain line sizing as per IPC
Horizontal drain slope selection as per IPC
Vertical drain stack sizing as per IPC
Vent pipe sizing as per IPC
Pressurized plumbing lines design
Oil/Grease interceptor sizing
Rain water Gutter & Pipe sizing

Pumps & Components Design and Selection:
Types of pumps in plumbing
Water supply transfer pump design & selection
Water supply booster pump design & selection
Submersible pump design & selection
Sewage pump design & selection
Hot water recirculation pump design & selection
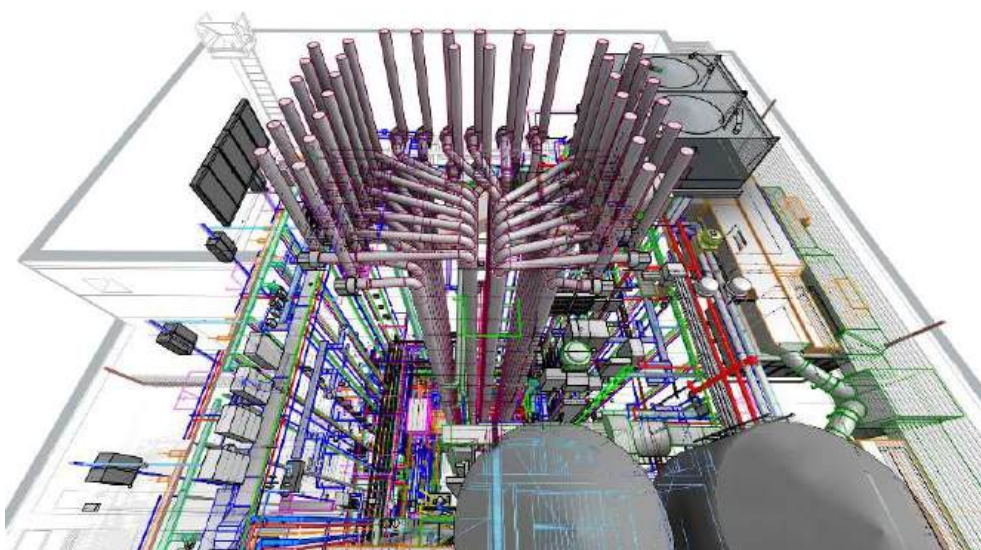
Booster pump expansion vessel sizing
Pump head calculation manually and using excel sheet
Pump power calculations
Net positive suction head (NPSHa, NPSHr)
Selecting pumps using technical data sheets

External Plumbing System:
Manhole sizing and cover selection
Manhole cover selection (light, medium, heavy duty)
External drainage systems
External water supply systems
Manhole invert level, cover level, depth calculations
Storm water drainage systems
Roof drain design and selection
Rain water Gutter & Pipe sizing
Oil/Grease interceptor sizing
Sewage treatment plant concept

Pipe Materials and Selection:
Water supply pipe materials and selection
Drainage pipe materials and selection

Plumbing - Drafting
Plumbing drawings preparation (tender, IFC, shop, as-built)
Plumbing isometric drawings preparation
Plumbing riser diagrams
Plumbing project

Softwares & Tools:

IPC Data sheets
MCQUAY PIPE SIZER - Cold/Hot water pipe sizing
MS EXCEL - BOQ, QS, Cost Estimation, Pump selection
AutoCAD - Drafting

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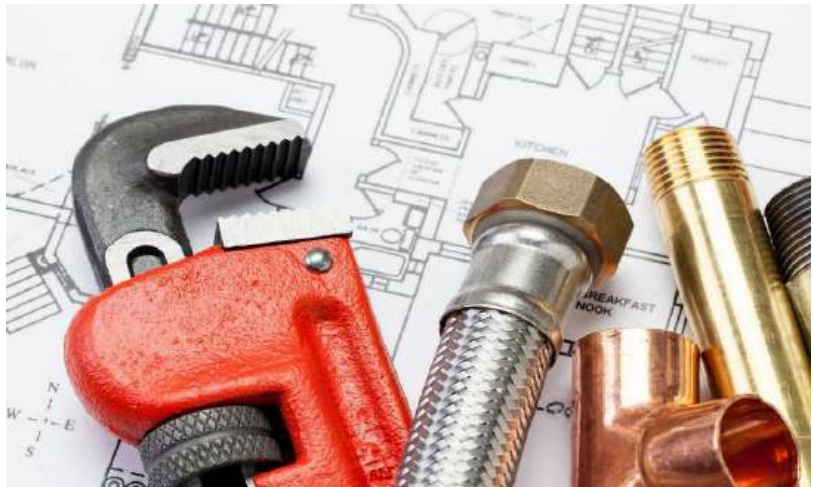
COURSE ID :- AM 4 - PART 2 - FIRE FIGHTING DESIGNING & DRAFING
COURSE CONTENT

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Fire Fighting - Introduction and Basics:

Introduction to fire fighting systems
Fire fighting standards (NFPA, NBC, UAE)
Fire hazard classification
Fire triangle concept
Getting familiar with fire fighting drawings

Fire Extinguishers (NFPA 10, NFPA 2001):

Fire class
Fire extinguishers types
Selection of fire extinguishers as per NFPA 10
Mounting details and spacing of fire extinguishers
FM200 system design and selection as per NFPA 21
FM200 system cylinder volume calculation and selection
Components of FM200 system

Sprinkler System Design (NFPA 13):

Selecting type of sprinkler system for buildings
Types of sprinklers (upright, pendent, sidewall)
Sprinkler color codes, RTI
Dry sprinkler system
Wet sprinkler system
Preaction sprinkler system
Deluge sprinkler system
Sprinkler system pipe circuits
Valves and accessories for sprinkler system
Sprinkler pressure requirements as per NFPA 13
Sprinkler pipe routing
Sprinkler pipe sizing (NFPA 13)

Sprinkler K values
Sprinkler water demand calculation
Hazen Williams equation
Manual hydraulic calculation
Hydraulic calculation using Elite software

Standpipe and Fire Hose System Design (NFPA 14):

Analyzing the building for standpipe system
Dry riser system design & selection
Wet riser system design & selection
Fire hose reel cabinet set selection and location
Landing valve selection and location
Internal and external fire hydrants
Fire brigade valve (breeching inlet)
Valves and accessories for standpipe system
Standpipe & fire hose system pipe routing
Standpipe & fire hose system pipe sizing
Standpipe system pressure requirements as per NFPA 14
Hose stream water demand calculation

Fire Tank Design and Sizing:

Fire water demand calculation
Fire water tank volume calculation and sizing
Combined fire + domestic water tank sizing
Underground and overhead tank sizing as per NFPA & NBC
Types of fire tanks and materials
Fire tank connections

Fire Pump Design (NFPA 20):

Fire pump flowrate calculation
Fire pump head calculation
Fire pump set design & selection (electrical, diesel, jockey)
Vortex inhibitors
Fire pump & pump room components
Valves and accessories for fire pump

Fire Alarm System (NFPA 72):

Selection and placing of fire detectors
Correcting detectors spacing as per NFPA 72
Selection and location of manual call points
Selection and location of sounders
Control and monitoring modules
Fire alarm control panel (FACP)
Fire alarm circuit
Wires and cables in fire alarm system

Foam System (NFPA 11, NFPA 16):

Foam system working
Foam system selection
Design methods
Design calculations

CO2 System (NFPA 12):

Surface, deep-seated concept
CO2 system working
CO2 system selection
CO2 design methods
Design calculations using manual/software

Clean Agent System (NFPA 2001):

Types of clean agents
Inert gases and halocarbon agents

System selection
FM 200 system
Flooding quantity
Design calculations

Fire Fighting - Project:

Fire fighting drawings preparation
Fire fighting isometric drawings preparation

Softwares & Tools:

NFPA/DEWA standards - Design calculations
FM-200 Selector - Clean agent selection
MS Excel - Design calculations
Elite - Hydraulic calculation
AutoCAD - Drafting

COURSE ID :- AM 5 - MEP.MECHANICAL DESIGNING & DRAFING (AM2+AM4)
COURSE CONTENT

HVAC Designing and Drafting, Plumbing Designing and Drafting, Fire Fighting Designing and Drafting, Fully Included

(Included AM2 - HVAC Designing and Drafting & AM 4 - Plumbing and Fire fighting Designing and drafting)

## COURSE ID :- AM 6 - MEP DESIGNING & DRAFING (MECH+ELECH) (AM2+AM3+AM4)
COURSE CONTENT

HVAC Designing and Drafting, Electrical Designing and Drafting, Plumbing Designing and Drafting, Fire Fighting Designing and Drafting, Fully Included

(Included AM2 - HVAC Designing and Drafting, AM3 - Electrical Designing and Drafting & AM 4 - Plumbing and Fire fighting Designing and drafting)

COURSE ID :- AM 7 - BUILDING INFORMATION MODELING (REVIT MEP,NAVISWORKS,BIM360,ACC)
(Architecture, HVAC, Electrical,Plumbing, Fire fighting)
COURSE CONTENT
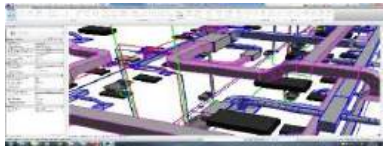
PART 1 - REVIT MEP - ARCHITECTURE PART:

Introduction to Building Information Modeling (BIM) and REVIT • Various BIM file formats • BIM dimensions (3D, 4D, 5D, 6D, 7D) • Level of Development (LOD), Level of Detailing (LOD) • Interface familiarity and keyboard commands • Customizing commands and units • Template setting and view properties • Draw and modify tools • Architecture layout preparation • Elevation and levels • Wall, window, door, floor, ceiling, and roof creation • Stairs, curtain walls, mullion, and shaft incorporation • Full building preparation • Area creation and volume computation • Material properties, including wall materials and paints • Project practice, walkthrough, and rendering

PART 2 - REVIT MEP - HVAC PART:
Starting HVAC project and central file creation • Worksets and collaboration • Introduction to BIM 360 • Systems template creation and selection • Linking REVIT Architecture and AutoCAD files • Space preparation and input, including conditioned, unconditioned, and plenum spaces • Zone creation and management • Analytical models and ventilation settings • Heating and cooling loads calculation and report • Grilles, diffusers, air terminals, and HVAC equipment placement • Duct and pipe system design, including sizing, routing, and pressure loss analysis • Mechanical equipment addition and piping system creation • HVAC legends, detailing, and sections • Quantity surveying and cost estimation using REVIT • Exporting schedules and quantities to Excel

PART 3 - REVIT MEP - ELECTRICAL PART:
Starting electrical project and central file creation • Worksets and collaboration • Introduction to BIM 360 • Systems template creation and selection • Linking REVIT Architecture and AutoCAD files • Room bounding, level creation, and visibility control • Electrical systems creation, including wires, distribution, and demand factors • Lighting circuit design and analysis • Power circuit placement, switch systems, and load balancing • Emergency lighting circuit creation and loop implementation • Detailing, sections, and final schedules • Quantity surveying and cost estimation using REVIT • Exporting schedules and quantities to Excel

PART 4 - REVIT MEP - PLUMBING PART:
Starting plumbing project and central file creation • Worksets and collaboration • Introduction to BIM 360 • Systems template creation and selection • Linking REVIT Architecture and AutoCAD files • Level creation and monitoring • Drainage and vent system design, including pipe materials and types, fixture placement, and slope calculation • Water supply system creation, tank placement, and pipe routing • Plumbing legends, detailing, and sections • Quantity surveying and cost estimation using REVIT • Exporting schedules and quantities to Excel

PART 5 - REVIT MEP - FIRE FIGHTING PART:
Starting fire fighting project and central file creation • Worksets and collaboration • Introduction to BIM 360 • Systems template creation and selection • Linking REVIT Architecture and AutoCAD files • Fire standards and hazard analysis • Sprinkler system design, including selection, spacing, and pipe routing • Standpipe and fire hose system design • Fire extinguishers placement • Fire pump and pump room design • Fire alarm system setup and configuration • Detailing, sections, and final schedules • Quantity surveying and cost estimation using REVIT • Exporting schedules and quantities to Excel

PART 6 - BIM - NAVISWORKS:
Interface familiarity and keyboard commands • File formats (.NWC, .NWF, .NWD) • Appending, merging, and linking files • Units, navigation, and render styles • Mark-up and modify tools, sets, and selection • Quantification, animation, and clash detection • 4D simulation and creating reports • Coordination with REVIT

PART 7 - REVIT MEP - COORDINATION:
Local server and BIM 360 coordination • Autodesk construction cloud collaboration • Monitoring and coordinating the project • Interference checking (clash detection) and correction

PART 8 - REVIT MEP - FAMILY CREATION:
Interface familiarity and family templates • Modeling tools and parameters creation • Parametric family creation and lookup tables

PART 9 - REVIT MEP - SHEET SETTING, DETAILING, DOCUMENTATION:
Documentation view creation and parameters • Plan views duplication and discipline categorization • Sectional drawings, riser diagrams, and isometric views • Annotations, dimensions, legends, and import/export formats • Detailing layouts and all necessary families • Sheet setting and printing layouts

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COURSE ID :- AM 8 - REVIT MEP
(Architecture, HVAC, Electrical,Plumbing, Fire fighting)
COURSE CONTENT

Everything is included as per AM7, except Parametric family, Navisworks, BIM360, Autodesk Construction Cloud.
(Excluded :- Prametric family, Navisworks,BIM360,ACC)

COURSE ID :- AM 9 - MEP QUANTITY SURVEYING AND COST ESTIMATION
COURSE CONTENT

Introduction to HVAC Quantity surveying and estimation
Understanding the basics of HVAC quantity surveying and estimation.
Exploring the role of quantity surveyors and estimation engineers in the MEP industry.

Roles of Quantity surveyor and Estimation engineer
Understanding the specific responsibilities and duties of quantity surveyors and estimation engineers.
Exploring how these roles contribute to the successful execution of MEP projects.

Standards
FIDIC,POMI,SMM

Pre-tendering and post-tendering
Learning about the processes involved in both pre-tendering and post-tendering phases of MEP projects.
Understanding the importance of each phase and their impact on project outcomes.

Client, Consultant, Contractor
Understanding the roles and responsibilities of key stakeholders in MEP projects, including clients, consultants, and contractors.
Exploring how collaboration among these parties contributes to project success.

Project Scope (SOW)
Understanding the project scope or statement of work (SOW) and its significance in MEP projects.
Learning how to define and manage project scope effectively.

Bill of Quantities
Exploring the concept of bill of quantities (BOQ) and its importance in MEP projects.
Learning how to prepare and manage BOQs accurately.

Specifications
Understanding the importance of specifications in MEP projects and how they influence project outcomes.
Learning how to interpret and apply specifications effectively.

Vendors list
Exploring the process of creating and managing a vendors list for procuring materials and services in MEP projects.
Learning how to evaluate and select vendors based on project requirements.

Tender addendums
Understanding the purpose and significance of tender addendums in the bidding process.
Learning how to prepare and manage tender addendums effectively.

Contract types
Exploring different types of contracts used in MEP projects, such as lump sum, cost-plus, and time and materials contracts.
Understanding the advantages and disadvantages of each contract type.

Contract norms
Learning about standard contract norms and regulations governing MEP projects, such as FIDIC contracts.
Understanding how to comply with contract norms to ensure project compliance and success.

Request for information (RFI)
Understanding the RFI process and its importance in clarifying project requirements and resolving issues.
Learning how to prepare and respond to RFIs effectively.

Cost estimation
Exploring various methods and techniques used for cost estimation in MEP projects.
Learning how to prepare accurate cost estimates based on project requirements and constraints.

Negotiation
Understanding the negotiation process and its role in securing favorable terms and conditions for MEP projects.
Learning effective negotiation strategies and techniques.

Letter of Intent and Acceptance (LOI/LOA)
Understanding the purpose and significance of letters of intent /acceptance in initiating contractual agreements.
Learning how to draft and manage LOIs effectively.

Material Procurement
Exploring the process of procuring materials for MEP projects, including sourcing, purchasing, and delivery.
Learning how to manage material procurement efficiently to meet project deadlines and budget constraints.

Material submittals
Understanding the process of submitting materials for approval in MEP projects.

Method statement
Exploring the purpose and importance of method statements in detailing how specific tasks will be executed in MEP projects.

Confirmation on Verbal instruction (CVI)
Understanding the process of confirming verbal instructions in writing to avoid misunderstandings and disputes.

Inspection requests (IR)
Exploring the process of submitting inspection requests to ensure compliance with project specifications and regulations.

Procurement
Understanding the procurement process and its importance in acquiring goods and services for MEP projects.

DPR, WPR, MPR
Understanding different types of project progress reports, such as daily progress reports (DPRs), weekly progress reports (WPRs), and monthly progress reports (MPRs).

Material requisition (MR)
Exploring the process of requisitioning materials for MEP projects.

All items in HVAC, ELECTRICAL, PLUMBING, FIRE FIGHTING

Comprehensive coverage of all materials, equipment, and components involved in HVAC, electrical, plumbing, and fire fighting systems.

Planswift software
Introduction to Planswift software for quantity surveying and cost estimation in MEP projects.
Hands-on training on using Planswift for accurate quantity takeoffs and cost estimations.

Detailed quantity surveying using Planswift
Practical exercises and case studies on performing detailed quantity surveying using Planswift software.
Learning how to extract accurate quantities and measurements from project drawings.

Quantity surveying check-list
Understanding the key elements of a quantity surveying check-list and its role in ensuring thoroughness and accuracy.
Learning how to create and utilize quantity surveying check-lists effectively.

Exporting Planswift quantities in Excel
Learning how to export quantity surveying data from Planswift into Excel for further analysis and reporting.
Understanding the process of formatting and organizing data in Excel for easy interpretation.

Quantity takeoff sheet preparation
Understanding the components and structure of a quantity takeoff sheet in MEP projects.
Learning how to prepare and organize quantity takeoff sheets effectively.

Bill of Quantities (BOQ) preparation
Detailed training on preparing bill of quantities (BOQs) for MEP projects.
Understanding how to compile accurate and comprehensive BOQs based on project requirements.

Additions and deletions
Learning how to make additions and deletions to BOQs based on project changes and updates.
Understanding the importance of maintaining BOQ accuracy throughout the project lifecycle.

Collecting material rates from suppliers as per vendors list
Understanding the process of collecting material rates from suppliers and vendors as per predefined lists.
Learning how to negotiate and finalize material rates to ensure cost-effective procurement.

Evaluating and Comparing Quotations
Exploring strategies for evaluating and comparing quotations from different suppliers and vendors.
Learning how to select the best-value quotations based on project requirements and budget constraints.

Manhour calculations
Understanding the concept of manhour calculations and its importance in estimating labor costs for MEP projects.
Learning how to calculate manhours accurately based on project scope and requirements.

Labour rate calculations
Learning how to calculate labor rates for different types of work and trades in MEP projects.
Understanding the factors influencing labor rates and how to incorporate them into cost estimations.

Considering profit and overhead
Understanding the concepts
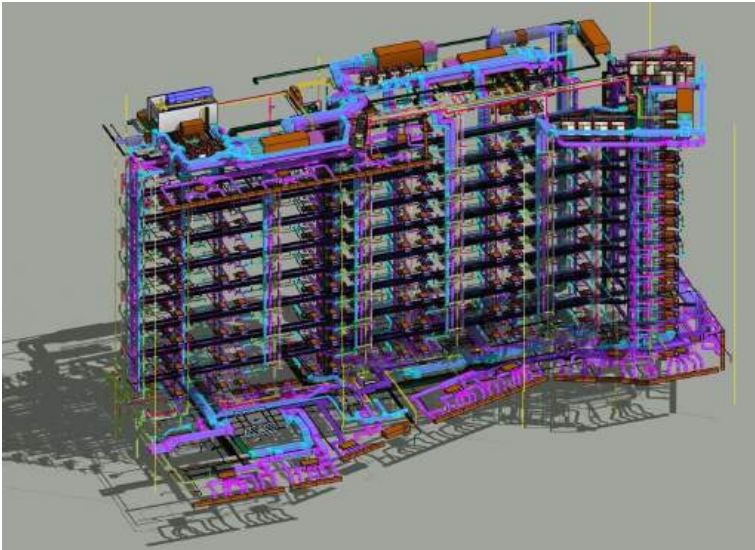
Important Excel Functions
Rate Analysis
Varations
Value Engineering

Submission
Understanding how to submit the project

Projects
Project 1 - Fitout Project
Project 2 - Commercial Project

COURSE ID :- AM 1A - BUILDING SERVICES ENGINEERING (MEP/BIM) (FULL COURSE)
BASICS TO ADVANCED LEVEL - 100% syllabus included
COURSE CONTENT

HVAC Designing and Drafting, Electrical Designing and Drafting, Plumbing Designing and Drafting, Fire Fighting Designing and Drafting, Building information Modeling, Quantity surveying and Cost estimation ETC Fully Included

Included (All Cources included)
AM2 - HVAC Designing and Drafting
AM3 - Electrical Designing and Drafting
AM 4 - Plumbing and Fire fighting Designing and drafting
AM 6 - MEP Designing and Drafting (AM2+AM3+AM4)
AM 7 - Building Information Modeling (Revit MEP,Navisworks,BIM 360,ACC)
AM 9 - MEP Quantity Surveying and Cost Estimation

COURSE ID :- AM 1B - BUILDING SERVICES ENGINEERING (MEP/BIM)
BASICS TO INTERMEDIATE LEVEL - All important topics included
COURSE CONTENT

HVAC Designing and Drafting, Electrical Designing and Drafting, Plumbing Designing and Drafting, Fire Fighting Designing and Drafting, Building information Modeling, Quantity surveying and Cost estimation important topics Included

Important topics of the following courses included:

AM2 - HVAC Designing and Drafting

AM3 - Electrical Designing and Drafting

AM 4 - Plumbing and Fire fighting Designing and drafting

AM 6 - MEP Designing and Drafting (AM2+AM3+AM4)

AM 7 - Building Information Modeling (Revit MEP,Navisworks,BIM 360,ACC)

AM 9 - MEP Quantity Surveying and Cost Estimation

Excluded

HVAC - Chillers, Chilled water Pumps,Cooling tower and other Chilled water Systems,Filter,Insulation,Acoustics,Cold storage,Clean rooms, Stairwell /Lift pressurization,District cooling,Thermal storage

Plumbing & Fire Fighting - Booster tank,Hot water system,Isometrics,Sump pump,Storm water,Oil/Grease interceptors, Vent system, Fire Fighting Hydraulic calculation using Elite Software

Electrical - Solar System, ETAP

BIM - Navis works, BIM 360, Autodesk Construction Cloud

QS & Estimation - Project 2

*Logos of standards used while designing