



BRITISH ENGINEERING INSTITUTE
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INTERNATIONAL RESEARCH FOUNDATION UK

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AMERICAN COUNCIL OF
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MEP COURSES



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Introduction of

JP JACOBS INTERNATIONAL RESEARCH FOUNDATION

We, JP Jacobs international Research Foundation is principally promoting Engineering Research works in various fields of Engineering, especially in the MEP Engineering (HVAC , Fire Fighting , Plumbing ,Electrical)

JP Jacobs International Research Foundation guide the engineers to find the proper career paths through our job-oriented technical courses and we are aiming to nourish the engineers with thorough knowledge in relevant engineering fields, especially in the MEP systems

MEP (HVAC , Fire Fighting , Plumbing ,Electrical) is the very vast subject in engineering and the engineers can certainly find the job after the engineering study , particularly Mechanical engineers, and electrical engineers

GCC and European countries is the greatest platform to the engineers to find the best career after their engineering study with best MEP knowledge. Engineering students must carry with international standers to meet the minimum requirement for find the suitable job.

We, JP Jacobs international Research Foundation study wisely and established a Job oriented MEP courses to the engineers , that can help the engineers to meet the suitable job

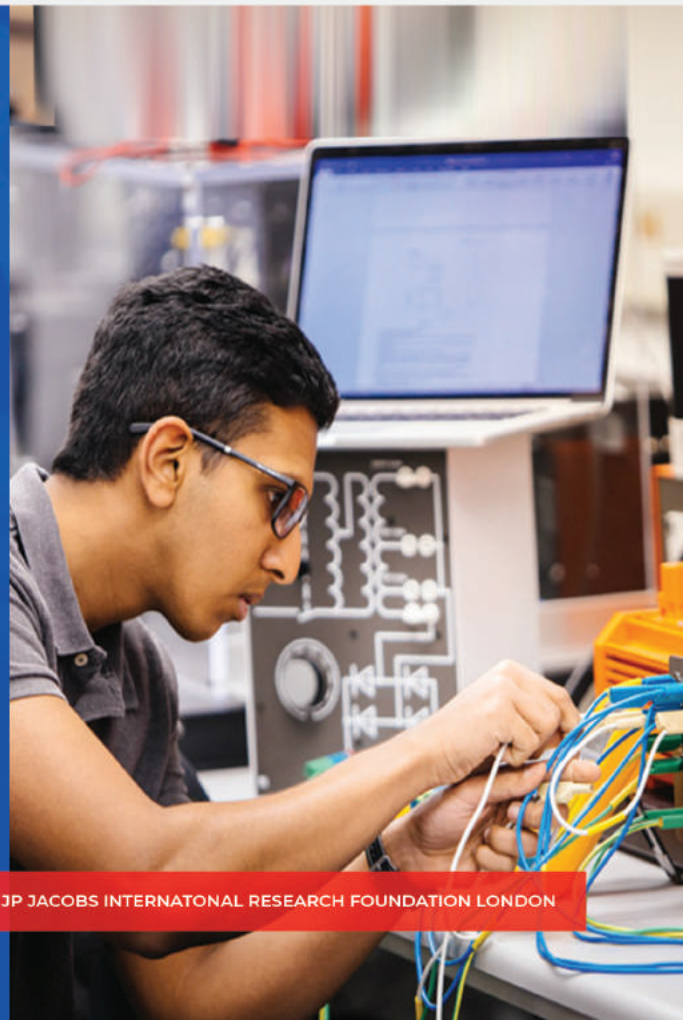
EDUCATIONAL LICENCES OF JP JACOBS

JP JACOBS INTERNATIONAL UNIVERSITY is a high-ranking education establishment registered at USA File Number: 5853200, which accredited by CPD -UK , AMERICAN COUNCIL OF TRAINING AND DEVELOPMENT – USA , ISO 9001:2015.and tie up with many international universities.Affiliated with California University FCE, Los Angeles ,USA

JP JACOBS INTERNATIONAL RESEARCH FOUNDATION LONDON incorporated under the Act 2006 as its registered office is in England and Wales , registration Schedule 2 of the (Model Articles) Regulations 2008 ,Registration Number 13563015 .

Also, **JP JACOBS INTERNATIONAL RESEARCH FOUNDATION** is duly incorporated under the State Laws at United States of America, State Original ID: 2021-000993061, as conducting Engineering Research activities and promoting Technical Education.

Additionally, JP Jacobs international Research Foundation is Licensed under section 8(1) incorporation Government of India, License Number – 123136. Corporate Identity Number is U80302KL2021NPL067052. It is a Non-Profit Organization (NPO) as per the Indian act



POST GRADUATE DIPLOMA IN ELECTRICAL ENGINEERING

BRITISH ENGINEERING INSTITUTE
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Module 1: Basics of Electrical

Chapter 1: Introduction to Electrical

- 1.1 Fundamentals of Electrical Engineering
- 1.2 Types of Electricity
- 1.3 Sources of Electricity
- 1.4 Generation, Transmission, Distribution and Utilization of Electricity
- 1.5 Ohm's Law
- 1.6 Electrical Terms and terminology
- 1.7 Categorization of Loads
- 1.8 Electrical Associations, Codes and Standards.

Chapter 2: Electrical Equipment's

- 2.1 Transformers
- 2.2 Motors
- 2.3 Generators
- 2.4 Capacitors
- 2.5 Bus bars, Bus ducts
- 2.6 Control Devices
- 2.7 Measuring Devices
- 2.8 Isolators
- 2.9 UPS

Module 2: Electrical Load Calculation

Chapter 1: Categorization of Electrical Loads

- 1.1 Lighting Load
- 1.2 Equipment Load
- 1.3 Utility Load
- 1.4 HVAC Loads
- 1.1 Lighting Load
- 1.2 Equipment Load
- 1.3 Utility Load
- 1.4 HVAC Loads

Chapter 3: Earthing

- 3.1 Why earthing is important?
- 3.2 Earthing Methods
- 3.3 Earthing area calculations
- 3.4 Earthing conductor sizing

Chapter 5: UPS

- 5.1 Types of UPS
- 5.2 UPS Calculation

Chapter 2: Electrical Loads and Calculation

- 2.1 Lighting load calculation based on LUX level
- 2.2 Power Load calculations
- 2.3 Circuit Connections
- 2.4 Circuit breakers calculation
- 2.5 Types of Circuit Breakers - MCB, MCCB, ACB, VCB & RCCB
- 2.6 Short Circuit current calculations
- 2.7 Capacitor bank calculations and sizing
- 2.8 Voltage Drop calculation
- 2.9 Transformer capacity calculations and sizing

Chapter 4: Diesel Generator

- 4.1 Types of DG Set
- 4.2 Calculation of DG Set

Module 3: Power System Design

Chapter 1: Power Sockets

- 1.1 Types of Power Sockets
- 1.2 3 Pin Socket connections
- 1.3 2 Pin Socket connections
- 1.4 Wiring Diagram of control switch board

Chapter 3: Cable Routing

- 3.1 cable conduits
- 3.2 Cable Trays

Chapter 2: Wires and Cables

- 2.1 Classification of wire
- 2.2 Selection of wire
- 2.3 Sizing of wire
- 2.4 Classification of cables
- 2.5 Selection of cables
- 2.6 Sizing of cables
- 2.7 Resistance and impedance for cables

Module 4: Schematic Drafting of Electrical

- 4.1 Preparation Symbols & Legends of Electrical System
- 4.2 Preparation of detail layouts including sectional details wherever required
- 4.3 Representation of Design drawing
- 4.4 Preparation of Single line Schematic & isometric Drawing of Wiring, lights, other required sections.

MODULE 5: Project Documents

- 5.1 Preparing Master BOQ or Estimation Quotation for the project.
- 5.2 Cable Schedule Preparation

DIPLOMA IN MEP ENGINEERING SUBJECTS WILL VARY



POST GRADUATE DIPLOMA IN FIRE FIGHTING ENGINEERING

BRITISH ENGINEERING INSTITUTE
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MODULE 1: Introduction to FP&FA.

Chapter 1: Basics of FP & FA

- 1.1 What is Fire Protection?
- 1.2 What is fire triangle?
- 1.3 Why Fire Protection System is needed?
- 1.4 What is Fire Alarm System?
- 1.5 Why is Fire Alarm needed?
- 1.6 Fire Associations, codes and standards.
- 1.7 Fundamentals of Fire System

MODULE 3: Fire Protection System

Chapter 3: Fire Protection System

- 3.1 Fundamentals of Fire Protection system.
- 3.2 Classification Fire Fighting system

Chapter 4: Sprinkler System

- 4.1 Sprinkler System – Dry & Wet Riser Systems
- 4.2 Types of Sprinklers
- 4.3 Pipe Sizing in sprinkler system
- 4.4 Sump Capacity Calculation
- 4.5 Over Head Tank Capacity Calculation

Chapter 6: Piping Materials

- 6.1 Various Piping Materials
- 6.2 Properties of Piping Materials
- 6.3 Metallic Pipes
- 6.4 Non-Metallic Pipes

MODULE 4: Fire Alarm System

Chapter 8: Fire Alarm System

- 9.1 Classification of Fire Alarm System
- 9.2 Types of sensors
- 9.3 Fire Panel Selection

MODULE 5: Fire Suppression System

Chapter 10:

- 10.1 FM200 Gas Suppression system.
- 10.2 Stairwell pressurization system.

MODULE 6: Piping Layout Drafting

Chapter 11: Schematic Drawings preparation

- 11.1 Studying Layout
- 11.2 Symbols and Legends
- 11.3 Drawing SLD
- 11.4 Elevation Drawings
- 11.5 Preparation of shop drawings

MODULE 2: Building Classification for Life Safety

Chapter 2: Building Classification

- 2.1 General Requirements for life safety in the buildings.
- 2.2 Classification of Buildings for fire protection.

Chapter 5: Piping fixtures and valves.

Fittings

- 5.1 Fittings: Elbow
- 5.2 Tee
- 5.3 Reducer
- 5.4 Cross
- 5.5 Coupling
- 5.6 Union
- 5.7 End Cap
- 5.8 Y-Bend
- 5.9 Return Bend
- 5.10 Puddle Flange

Accessories

- 5.11 Valves (Gate, Globe, Angle)
- 5.12 Strainer
- 5.13 Flexible Connections
- 5.14 Pressure Gauge
- 5.15 N R V (Non-Return Valve)

Chapter 7: Pump Capacity Calculations

- 7.1 Introduction to Pumps
- 7.2 Types of Pumps
- 7.3 Pump Selection criteria
- 7.4 Pump Head loss Calculation
- 7.5 Pump Capacity calculation
- 7.6 Booster pump Capacity calculation

Chapter 9: Public Address System

- 9.1 Classification of PA System.
- 9.2 Selection of PA system.

DIPLOMA IN MEP ENGINEERING SUBJECTS WILL VARY



POST GRADUATE DIPLOMA IN PLUMBING ENGINEERING



MODULE 1: Introduction to Plumbing.

Chapter 1: Basics of Plumbing

- 1.1 What is plumbing Engineering?
- 1.2 Why is plumbing needed?
- 1.3 Plumbing Associations, codes, and standards.
- 1.4 Fundamentals of Plumbing System.

MODULE 3: Plumbing System

Chapter 3: Water Supply Systems

- 1.1 Fundamentals of water supply system.
- 1.2 Types of water supply system (Hot and Cold)

Chapter 5: Domestic Water Distribution System

- 5.1 Requirement of water supply system
- 5.2 Water quantity requirement calculation
- 5.3 Sump -Underground storage capacity calculation
- 5.4 Over Head tank calculation
- 5.5 Types of Pumping systems

Chapter 6: Piping fixtures and valves.

Fittings

- 6.1 Fittings: Elbow
- 6.2 Tee
- 6.3 Reducer
- 6.4 Cross
- 6.5 Coupling
- 6.6 Union
- 6.7 End Cap
- 6.8 Y-Bend
- 6.9 Return Bend
- 6.10 Puddle Flange

Accessories:

- 6.11 Valves (Gate, Globe, Angle)
- 6.12 Pressure Reducing Valve
- 6.13 Water Hammer Resistor
- 6.14 Strainer
- 6.15 Float Valve
- 6.16 Foot Valve
- 6.17 Flexible Connections
- 6.18 Automatic Air Vent
- 6.19 Pressure Gauge
- 6.20 N R V (Non-Return Valve)

MODULE 4: Sanitary and Drainage System

Chapter 9: Introduction to Drainage System

- 9.1 Over view
- 9.2 Drainage Piping Material

Chapter 10: Drainage System Equipment's

- 10.1 Working of grease Interceptor
- 10.2 Working of Oil Interceptor
- 10.3 Sewage Ejector Working
- 10.4 Septic Tank Working

MODULE 5: Plumbing Systems

Chapter 12: Garden Water Sprinkler System

Chapter 13: Swimming Pool

Chapter 14: Water Fountain

Chapter 15: Solar Water Heating System

MODULE 7: Project Documents

- 18.1 Preparing Master BOQ or Estimation Quotation for the project.
- 18.2 Preparing Material Procurement List.

MODULE 2: Basics of Fluid Mechanics

Chapter 2: introduction to Fluid Mechanics

- 1.1 Types of Flow
- 1.2 Types of Water
- 1.3 Continuity Equations
- 1.4 Units and Conversion
- 1.5 Hazen Williams Formula
- 1.6 Velocity of Liquid in open Channel Manning's Formula

Chapter 4: Fittings and Fixtures

- 4.1 Plumbing Fixture
- 4.2 Bathroom & toilet fixtures
- 4.3 Water closet
- 4.4 Bath tub
- 4.5 Shower tray
- 4.6 Bidet
- 4.7 Floor drain
- 4.8 Urinals
- 4.9 Flush tank
- 4.1 Flush valves
- 4.2 Kitchen sink
- 4.3 Dish washer

Chapter 7: Piping Materials.

- 7.1 Various Piping Materials
- 7.2 Properties of Piping Materials
- 7.3 Metallic Pipes
- 7.4 Non-Metallic Pipes

Chapter 8: Pump Capacity Calculations

- 8.1 Introduction to Pumps
- 8.2 Types of Pumps
- 8.3 Pump Selection criteria
- 8.4 Pump Head loss Calculation
- 8.5 Pump Capacity calculation
- 8.6 Booster pump Capacity calculation

Chapter 11: Drainage Piping & Accessories

- 11.1 Drainage Pipe Sizing
- 11.2 Drainage pipe traps
- 11.3 Drainage Fittings
- 11.4 Manhole Sizing

MODULE 6: Piping Layout Drafting

Chapter 16: Schematic Drawings preparation

- 16.1 Studying Layout
- 16.2 Symbols and Legends
- 16.3 Drawing SLD
- 16.4 Elevation Drawings
- 16.5 Preparation of shop drawings

POST GRADUATE DIPLOMA IN HVAC ENGINEERING



MODULE 1: Introduction to HVAC

Chapter 1: Basics of HVAC

- 1.1 What is HVAC
- 1.2 What is Heat?
- 1.3 Forms of Heat
- 1.4 Modes of Heat Transfer
- 1.5 Factors to be controlled for HVAC system
- 1.6 What is TR?
- 1.7 Associations, codes and Standards in HVAC Industry.

Chapter 3: Basic Refrigeration Cycle

- 3.1 Components of Basic Refrigeration Cycle
- 3.2 Working of Basic Refrigeration Cycle
- 3.3 Auxiliary components of Refrigeration Cycle
- 3.4 Experiencing refrigeration Cycle in Split AC, Window AC and Refrigerator.
- 3.5 What is Refrigerant?
- 3.6 What are Brines?
- 3.7 Properties of Ideal Refrigerants.
- 3.8 Commonly Used Refrigerants and Brines.

Chapter 2: Psychometrics

- 2.1 What is Air?
- 2.2 What is Psychrometry?
- 2.3 Properties of Psychrometry
- 2.4 Study of Psychrometry Chart.
- 2.5 Air Conditioning Processes.

Chapter 4: Classification of Components of Refrigeration Cycle

- 4.1 Classification of Compressors.
- 4.2 Classification of Condensers.
- 4.1 Classification of Expansion Devices.
- 4.2 Classification of Evaporators.

Chapter 5: Classification of Air Conditioning System

- 5.1 Classification based on Type of Refrigeration System.
- 5.2 Classification on Duct ability of the System.
- 5.3 Working and Installation of Various Air Conditioning Systems.
- 5.4 Parameters for Selection of Machine.
- 5.5 Design and Working of Centralized Air Conditioning Systems.
- 5.6 Parameters to be considered for Central AC.

MODULE 2: Air Distribution System

Chapter 1: Load Calculations

- 1.1 Why Heat Load Calculations Required
- 1.2 Categorizing Heat loads based on their process of transfer and Heat Form.
- 1.3 Parameters for Cooling and Dehumidification Loads.
- 1.4 Considering U value for Materials.
- 1.5 Considering Equivalent Temperature Differences for Materials.
- 1.6 Difference between Radiant Energy and Transmission Heat.
- 1.7 Concept of infiltration, Exfiltration and outside Air.
- 1.8 Calculating Grand Total Heat. 1.9 Calculating Ton of Refrigeration
- 1.10 Calculating Dehumidified CFM.
- 1.11 Finding Heat Load Calculation Using E20 Form.
- 1.12 Basic HAP Explanation.
- 1.13 Applying Heat loads to a project.
- 1.14 What are thumb rules for Load Calculation?
- 1.15 Can we really use thumb rules in projects?

Chapter 3: Static Pressure Calculation

- 3.1 What is Statics Pressure.
- 3.2 Need of Calculating Static Pressure.
- 3.3 Calculating Fan Capacity.
- 3.4 Types of Fans
- 3.5 Fan Selection Parameters.

Chapter 4: Designing of VRV/VRF System.

- 4.1 What is VRV / VRF System.
- 4.2 Advantages of VRF over conventional Air Conditioning Systems.
- 4.3 Components of VRF System.
- 4.4 Difference between Heat Pump and Heat Recovery System.
- 4.5 Selection of Indoor Unit.
- 4.6 Selection of Outdoor Unit.
- 4.7 Difference between 2 pipe and 3 Pipe System.
- 4.8 Applying VRF system for project.

Chapter 2: Designing of Duct Network

- 2.1 Space Notation
- 2.2 Types of Ducts
- 2.3 Shapes of Ducts
- 2.4 Material used for Ducts.
- 2.5 Insulation Materials for Ducts.
- 2.6 Air Terminals Classification and Selection
- 2.1 Locating Air Terminals
- 2.2 How to Draw Single Line Diagram (SLD)
- 2.3 Factors need to consider while Drawing SLD.
- 2.4 Methods for Duct Sizing
- 2.5 Duct sizing using Manual Ductulator.
- 2.6 Duct Sizing using Software.
- 2.7 Converting SLD to DLD (Double Line Diagram)
- 2.8 Ducting drawing Methods for DLD.
- 2.9 Duct Fittings.
- 2.10 Drawing DLD using fittings.
- 2.11 Discussion on Ducts Joining techniques.
- 2.12 Classification of Dampers.
- 2.13 Locating Dampers.
- 2.14 Ducting Supports

Chapter 5: Project Documents.

- 5.1 How to prepare Base of Design.
- 5.2 Preparing Building Information Sheet.
- 5.3 Making Ducting Bill of Quantity
- 5.4 Preparing Scope of Work.

POST GRADUATE DIPLOMA IN HVAC ENGINEERING

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MODULE 3: Hydronic System

Chapter 1: Basics of Hydronic System.

- 1.1 What is Hydronic System.
- 1.2 What is open System and closed system.
- 1.3 Materials used for Piping.
- 1.4 Insulation Materials.
- 1.5 Pipe Fittings.

Chapter 3: Project Documents.

- 3.1 Preparing piping Scope of Work
- 3.2 Preparing Piping BOQ.

Chapter 2: Designing of Hydronic System

- 2.1 Pipe routing
- 2.2 Pipe Sizing
- 2.3 Calculating GPM from TR.
- 2.4 Pipe fittings
- 2.5 Symbols used for Drafting.
- 2.6 Pipe Supports
- 2.7 Head Loss Calculations
- 2.8 Pump Capacity Calculations.

MODULE 4: Ventilation System

Chapter 1: Introduction to Ventilation

- 1.1 Definition of Ventilation
- 1.2 Types of Ventilation
- 1.3 Designing Toilet Ventilation System.
- 1.4 Fan Capacity calculation for Ventilation
- 1.5 Selection of Fan.
- 1.6 Ducted and Non-Ducted Car Parking Ventilation
- 1.7 Fresh Air Quantity Calculation
- 1.8 Fresh Air Fan Selection

Chapter 2: Kitchen Ventilation

- 2.1 Types of Kitchen Ventilation System
- 2.2 Types of Hoods.
- 2.3 Calculation of Exhaust Air and Fresh Air

Chapter 3: Staircase Pressurization

- 4.1 Concept of Stair Case Pressurization
- 4.2 Calculation of Stair Case Pressurization

MODULE 5: Project Documents

- 5.1 Preparing Ducting BOQ
- 5.2 Preparing Piping BOQ
- 5.3 Preparing Master BOQ or Estimation Quotation for the project.
- 5.4 Preparing Material Procurement List.
- 5.5 Preparation of Testing and Commissioning Reports.



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