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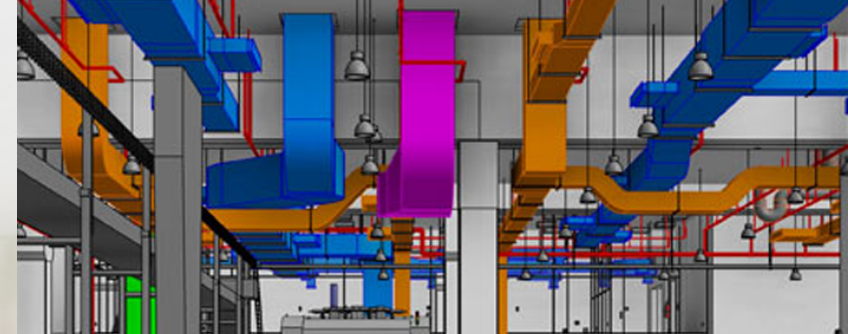
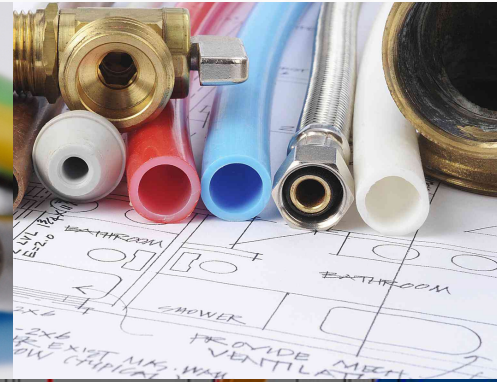
**E LECTRICAL**

**P LUMBING**

**F IRE FIGHTING**

**R EVIT MEP**

**R EVIT ARCHITECTURE**



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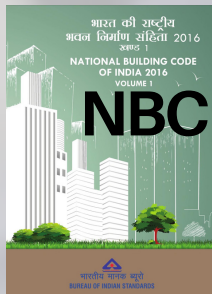
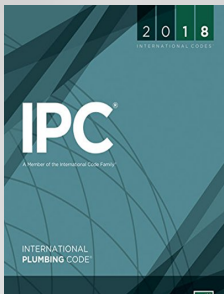
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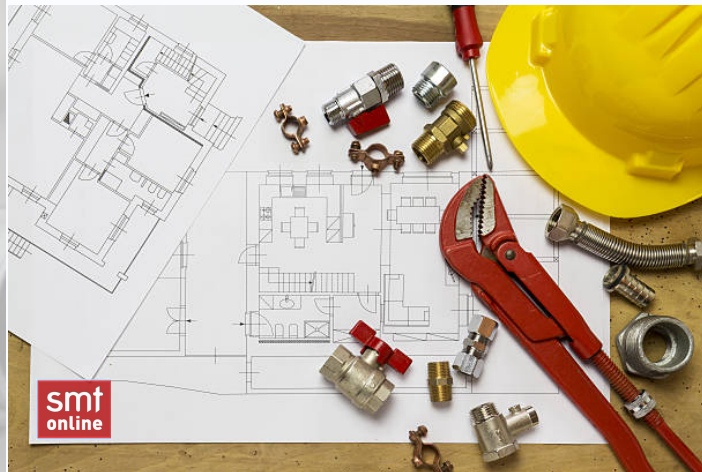
## COURSE STANDARDS



## SOFTWARES

- Pipe sizing excel program
- Pump sizing excel program
- Tank sizing excel
- Heater sizing excel

## PLUMBING SYSTEM DESIGNING



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## HIGHLIGHTS

- LIVE ONLINE TRAINING
- CLASSROOM TRAINING
- VIDEO COURSES
- GULF EXPERIENCE FACULTY
- DIGITAL CLASSROOM
- BASIC TO ADVANCE LEVEL
- CONCEPT BASED TRAINING
- SOFTWARE CALCULATION
- INTERACTIVE SESSIONS
- UPDATED SYLLABUS

## PROJECTS

- Villa project A
- Villa project C



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# PLUMBING SYSTEM DESIGNING SYLLABUS

## PART - 1

### Chapter: 1

#### INTRODUCTION TO PLUMBING

- MODULE - 01  
WATER SYSTEM
- MODULE - 02  
DRAINAGE SYSTEM

#### MODULE-1 WATER SYSTEM



- Introduction to Building Services
- Introduction to Plumbing
- What is Plumbing
- What is Plumbing System
- Classification of Plumbing
- Standard Societies or codes
- What is plumbing code
- Why Plumbing Codes
- Simple chemistry of water

- Sources of water
- Hard & soft water
- Plumbing fixtures & appliances.
- What is plumbing fixtures
- WC
  - European Type
  - Indian
  - Universal
- Flushing system of WC & Urinals:
  - Gravity Flush Tanks
  - Flush a meter tank
  - Flush valve



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- **Lavatory:**
    1. Single lavatory
    2. Lavatory with pedestal
    3. Lavatory tray
  - **Bath Tub:**
    - Bath tub
    - Whirlpool bath tub
  - **Shower**
    - Wall mounted
    - Hand shower
    - Shower Tray
  - **Bidet**
  - **Floor drain**
  - **Urinal**
  - **Kitchen sink**
    - Service sink
  - **Ablution tap**
  - **Electronic flush valve**
  - **Drinking fountain**
  - **Cooling tower**
  - **Water taps**
    - Faucet
    - Taps
    - Hose bib
  - **Dish washer**
  - **Washing Machine**
  - **Electric Water heater**
    - Submersible pump
  - **Pressure tank or vessel**
  - **Dish washer**
  - **Heater**
    - Unit water heater or Geyser
    - Central electrical water heater or boiler
    - Solar Water Heater
  - **Grease trap**
  - **Grease interceptor**
  - **Hair interceptor**
  - **Oil interceptor**
- Chapter: 2**  
**PLUMBING**  
**EQUIPMENTS**
- **Types of Pumps:**
    - Transfer Pump
    - Booster pump
    - Hydro booster pump
    - Hot water circulating pump

## Chapter: 3

# PIPE FITTING & ACCESSORIES

- Pipe fittings
  - 45-degree Elbow
  - 90-degree Elbow
- Tee
  - Equal Tee
  - Unequal Tee
- Cross
- Reducer
  - Concentric
  - Eccentric

- Coupling
- Union
- Nipple
- Mechanical Sleeve
- Plug
- Cap
- Adaptor
- Wye
- Pipe Accessories
  - Gate valve or isolating valve
  - Globe valve
  - Angle valve
  - Pressure reducing valve
  - Derivation for pressure exerted at bottom
- Placement of Pressure reducing valve
- g. Water hammer arrestor
- Strainer
- Float valve
- Foot valve
- Non return valve (NRV) or Check Valve
  - i. NRV
  - ii. Swing check
- Flexible connection
- Automatic air vent
- Pressure gauge

## PART - 2

### Chapter: 4

#### PIPE MATERIAL

- Types of family material
  - a. Metallic
  - b. Nonmetallic or Plastic
- **Metallic:**
  - G.I. pipe (Galvanized iron pipe)
  - Copper pipe
  - C.I pipe (cast iron)
- **Nonmetallic or Plastic:**
  - PVC pipe
  - CPVC pipe
  - UPVC pipe
  - PPR pipe
  - ABS Pipe
  - Pex pipe
  - HDPE pipe

### Chapter: 5

#### BASICS OF FLUID MECHANICS

- Types of flows
  - Laminar flow
  - Turbulent flow
- Types of water
  - Potable water
  - Sweet water
  - Hard water
- Continuity equation
- Flow also depends on
- Hazen William formulae
- Hazen William friction factor table

- Example for Pressure Drop through Pipe
- Manning Formulae



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# PART - 3

## Chapter: 6

### WATER SUPPLY IN BUILDING

- Classification of buildings
- Types of water supply systems in low- & high-rise buildings
  - Direct water supply system
  - Single booster system
  - Zone divided Single booster system
  - Overhead tank with terrace booster system
  - Series connected booster system with intermediate break tanks.

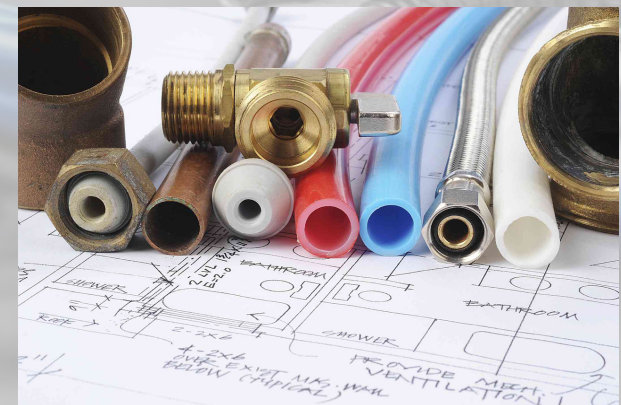
- Series connected booster system without intermediate break tanks.
- Transfer pump system or overhead distribution system.
- Selection of water supply system based on Energy consumption & boosting power.

## Chapter: 7

### FIXTURE UNIT

- What is a fixture Unit ?
  - WSFU
  - DFU
- Theory for water pipe sizing

- Pre-defined pipe sizes from standard (IPC)
- Standard velocity for pipes as per standard (ASPE)
- Manual cold water pipe sizing (IPC standard)
- Manual hot water pipe sizing (IPC standard)
- Manual cold + hot water pipe sizing (IPC standard)
- Same example by excel program (ASHRAE standard)



## **PART - 4**

### **Chapter: 8**

#### **ESTIMATING WATER DEMAND**

- People Method (Private) Manual Excel
- Area Method (Public) (Ashrae 62.1 code) Manual Excel
- Finding Total water demand
- Average water demand
- Peak water demand

### **Chapter: 9**

#### **PROJECT**

- Villa project Pipe Sizing for cold & Hot water
  - Reading Architectural layout
  - Application of project
  - Deciding water supply system
  - Deciding Type of flushing system
  - Deciding central electric water heater location
  - Drawing single line diagram
  - Pipe Sizing
- Cold water pipe sizing
- Hot water supply pipe sizing

- Hot water return pipe sizing
- Pipe sizing for peak demand

### **Chapter: 10**

#### **WATER HAMMER ARRESTOR**

- What is Water hammer Arrestor
  - Sizing as Per PDI standards
  - Placement as Per PDI standards
  - Selection as per (Zurn & mifab)

# **PART - 5**

## **Chapter: 11**

### **TANK SIZING**

- Tank sizing (as per PHE, NBC, IPC standard)
  - Underground tank (or) sump
  - Overhead tank (or) Roof tank
  - Loft tank
- Underground tank theory
- Roof tank theory
- Loft tank Theory
- What is free board
- Why to have free board
- Sizing underground tank private application by people's method
- Sizing roof tank for public application
- Sizing roof tank for private application by fixture method
- Finding dimensions of tanks by available volume
- Tank sizing by NBC (people's method & area method)
  - Total tank capacity
  - Domestic tank sizing
  - Grey water tank sizing
- Tank sizing as per IPC:
  - Total tank capacity
  - Domestic tank sizing
  - Grey water tank sizing
- Sizes of drain pipes for water tanks
- Sizes of Overflow and Drain pipes for water supply tank
- Loft tanks sizing as per NBC and IPC
- Tank sizing by Excel program
- Tank selection as per SINTEX make

## **Chapter: 12**

### **WATER HEATER SIZING**

- **Water heater sizing (as per ASPE) ASHRAE**
  - Unit water heater sizing
  - Central electric water heater sizing
  - Solar water heater panel sizing
  - Electric Water heater sizing by Excel program
- **Selection of Unit & Central electric water heater as per Jaguar make**
- **Finding KW as per ASPE**
- **Selection Solar water heater as per V-guard Evacuated Tube model**

## **PART - 6**

### **Chapter: 13**

#### **PUMP SIZING (AS PER IPC)**

- **Pump sizing (as per IPC)**
  - Sizing transfer pump
  - Sizing booster pump
  - Hot water circulating pump Sizing
  - Roof Booster pump sizing
  - Pressure tank Sizing

## **Chapter: 14**

### **GARDEN WATER SPRINKLER SYSTEM**

- **What is garden water sprinkler**
- **Types of garden water sprinkler**
- **Design of garden sprinkler system**

# MODULE-2 DRAINAGE SYSTEM

## PART - 7

### Chapter: 1

- Introduction to drainage
- AIMS of building drainage
- Sullage
- Excreta

### Chapter: 2

- Classification of pipes as per usage
- Soil pipe
- Wastewater pipe
- vent pipe
- Rainwater pipe
- Anti-Siphonage pipe.

### Chapter: 3

- Types of drainage systems
- What is stack
  - Single stack system
  - One pipe system
    - a) One pipe - Partially ventilated system
    - b) One pipe - Fully ventilated system
- Two pipe system
  - Two pipe system with common vent
  - Two pipe system with individual vents

## **PART - 8**

### **Chapter: 4**

- Slope in pipe
- What is slope
- Representation of slope

### **Chapter: 5**

- Sample project  
(commercial building)  
Pipe sizing AS PER NBC
- Sizing horizontal branch  
pipe for waste and soil  
pipe with specified slope.
- Sizing Vertical pipe or  
stack for soil &  
Wastewater.

- Sizing building Drain for  
Soil & Wastewater with  
specified slope.

### **Chapter: 6**

- What are traps
- Classification of traps &  
sizing.
- According to shape
  - P - trap
  - Q - trap
  - S-trap
  - Bottle trap

- According to use
  - Floor or Nahni trap
  - Gully trap
  - Intercepting trap
  - Grease trap or interceptor
  - Hair interceptor
  - Oil interceptor
  - Sand Interceptor

## **PART - 9**

### **Chapter: 7**

- Storm water drainage system
- Why storm water drainage is needed
- Advantages of Storm water drainage system
- Rainwater harvesting
- Sources of rainwater collection
- Methods of collecting rainwater
- What is storm water Runoff
- Runoff coefficient for materials

- What is Rainfall intensity
- Categories of Rainfall
- What is Area of Catchment & calculating for flat and sloped roof
- What is roof Gutter & types
- Example to size roof gutter with slope & downspout as per IPC
- Classification of roof drains
- Primary roof drain
- Secondary roof drain
- Example to design roof drainage network for Hyderabad location as per IPC.

### **Chapter: 8**

- Ventilation in Drainage Systems
- What is Ventilation
- Why ventilation is required
- Stack Ventilation
  - Stack Vent
  - Vent stack
  - Relief Vent
  - Yoke vent
- Trap Ventilation
  - Individual vent
  - Common vent
  - Circuit vent
  - Wet vent

- **Sizing Vent stack for wastewater stack for Commercial Building**
- **Sizing Vent stack for soil stack for Commercial Building**
- **Alternate Ventilating Systems**
- **Terrain P.A.P.A & pleura Drainage Ventilation System**
- **Benefits of Terrain Pleura System**
- **Design & Location for P.A.P.A**

# **PART - 10**

## **(EXTERNAL DRAINAGE SYSTEM IN BUILDING)**

### **Chapter: 9**

- What is Septic Tank
- What is Sedimentation
- Where are Septic Tanks used
- Contents of Septic Tanks
- How Septic tanks works
- Design Consideration for Septic Tanks
- Location of Septic tanks
- Septic tank Designing as per IS
- Sludge Withdrawal

- Sizing Septic tank for 20 users as per IS
- Sizing Septic tank for 20 users
- Manually by people method

### **Chapter: 10**

- What is Manhole
- Why Manhole is needed
- What is the difference between Manhole/ inspection Chamber
- Where manholes to be provided

- Classification of Manholes
  - Shallow manhole
  - Normal Manhole
  - Deep Manhole
- Design Consideration of Manholes
- What is Invert level
- Example to understand Invert level
- Determining Invert level for straight & sloped pipe
- Finding slope of Invert level
- Example - 1 for manhole sizing
- Example - 2 for manhole sizing



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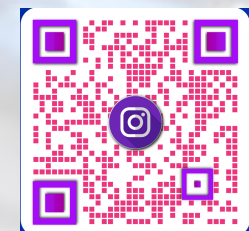
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LOCATION



YOUTUBE



INSTAGRAM