

1.6 PLUMBING SERVICES

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RATIONALE

Plumbing is said to be the system of pipes, tanks, fittings, and other apparatus required for water supply, heating, and sanitation in a building. Plumbers install, repair, and maintain piping systems in residential, commercial and industrial buildings. These systems traditionally included water distribution and wastewater disposal, but because of new technology that combines water and gas pipes, plumbers can work with vent, residential fire, irrigation, and chemical systems as well. The duties of a plumber include: installing, repairing and maintaining pipes, fixtures, and other plumbing equipment; opening walls and floors to accommodate pipes and pipe fittings; welding, connecting, and testing pipes for leaks; preparing cost estimates; interpreting blueprints and designs. Plumbers must also be aware of safety procedures and follow them at all times.

Diploma holders in Civil Engineering who normally work in supervisory positions, must not only be well versed with plumbing procedures, processes, equipment, safety requirements etc. but also be able to demonstrate all practical aspects of plumbing to as to effectively lead team of plumbers and ensure execution of quality work and excellent end results.

This subject is therefore, aimed at instilling theoretical and practical knowledge among students studying civil engineering at diploma level.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

- CO1: Identify and select proper tools and use them for the given plumbing work
- CO2: Select appropriate pipes and carry out pipe fitting after carrying out operations like cutting, bending, threading, joining, aligning and other necessary operations
- CO3: Erect simple water supply system. Trace leakage and repair water supply system
- CO4: Plan, prepare and inspect domestic drainage system
- CO5: Select and install sanitary appliances
- CO6: Install heating appliances like geyser, etc.

DETAILED CONTENTS

UNIT I

1. Plumber's Tools

Selection, use and care of tools required for plumbing work, such as threading die, bit brace, ratchet brace, pipe wrench, spanner set, pipe cutter, pipe vice, hacksaw, chisel, files and other common hand tools, bench drilling machine, soldering iron

UNIT II

2. Pipes and Pipe Fitting

Selection and use of different pipes like GI Pipes, Plastic pipes, PVC pipes, HDPE pipes, Cast iron pipes, Plumbing symbols; Bends, Elbows, Sockets, Tees, Unions, Pipe cutting, Pipe bending, Pipe Threading, Pipe joints, Pipe fitting, Alignment of pipes, Branching of pipes, Safety precautions.

UNIT III

3. Water Supply System

Sources of water; Rainwater harvesting; Water supply systems in a town; Water distribution systems; Distribution reservoirs; Pumps; Valves; Fire hydrants; Storage of water in buildings; Types of tanks; Laying water supply pipe lines

UNIT IV

4. Domestic Drainage

Drainage system (two pipe, one pipe, single stack and other systems), Trap, Cesspool, Sceptic tank, Cleaning blocked pipes and drains, Laying sanitary and sewer pipes, Manholes, Inspection and testing (pressure & leakage test, testing straightness of pipes, ball test etc.); Fixing accessories, Problems in drainage and their solution

UNIT V

5. Sanitary Appliances

Flush toilet, Squat toilet, Wash basin, Sink, Floor traps, Urinal, Bathtub, Shower, Bidet, Mixing tap, Popup waste

Heating System

Heat transfer, Water heater, Geyser, Domestic hot water supply system, Central heating, Solar water heater

RECOMMENDED BOOKS

1. Plumber by G. S. Sethi; Computech Publications Ltd, New Delhi (Available in English and Hindi)
2. e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

SUGGESTED WEBSITES

1. <http://swayam.gov.in>

INSTRUCTIONAL STRATEGY

During instructions, teacher should explain the use of various plumbing tools and demonstrate how to handle them properly. Liberal use of audio-visual aids may be made. Students may be asked to prepare models of different piping systems. Visit may be arranged for students to see how town water supply is arranged and managed. Detailed explanation with the help of actual sanitary appliances may be given about their use and method of installing them. This subject contains five units of equal weightage.