

**Savitribai Phule Pune University**  
**Faculty of Science & Technology**



**Curriculum**  
**For**  
**Bachelor of Vocational (Engg)**  
**First Year (Plumbing)**  
(Choice Based Credit System)  
(2020 Course)

**(With Effect from Academic Year 2024-25)**

## **1. Course Objectives**

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Plumbing, so that he/she is properly equipped to take up gainful employment in this vocational subject. Thus he/she should have acquired,

### **A. Understanding of**

- (a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that the students is able to understand the different vocational subjects.
- (b) The basic concepts in engineering drawing.
- (c) The concepts, principles and procedures used in Plumbing.
- (d) The knowledge of working of Plumbing components.
- (e) The procedure of replacing/installing Plumbing Components.
- (f) The concepts and principles used in advanced Plumbing technologies.

### **B. Adequate Professional Skills and Competencies in**

- (a) Providing Services to the society in the field of Plumbing
- (b) Testing the performance of Plumbing components.
- (c) Locating the faults in plumbing components.

### **C. A Healthy and Professional Attitude so that the student has**

- (a) An analytical approach while working on a job.
- (b) An open mind while locating/rectifying faults.
- (c) Respect for working with their own hands.
- (d) Respect for honesty, punctuality, and truthfulness.

**2.Course Structure:** The course will consist of combination of practice, theory and hands on skills.

**Curriculum:** The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components in plumbing.

**Skill Development Components:** The focus of skill development components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill Development components will be relevant to the industry as per its requirements.

- The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains of Plumbing.
- The curriculum will focus on work-readiness skills in each of the year of training.
- Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work.

#### **General Education Component:**

The general education component adheres to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of the total curriculum.

Adequate emphasis is given to language and communication skills.

## Syllabus

Course Code	Course Name	Teaching Scheme (Hrs/Wk)		Credits							
		Th	Pra	ISE	ESE	PR	OR	Total	TH	PR	Total
BVP1001	Introduction to Plumbing, Codes and Standards in Plumbing.(IPCSP)	03		50	50			100	03		03
BVP1002	Introduction to Plumbing Material & Terminologies in Plumbing. (IPMTP)	03		50	50			100	03		03
BVP1003	Introduction to Plumbing & Pumping System (IPPS)	03		50	50			100	03		03
BVP1004	Entrepreneurship Development- I (ED-I)	03		50	50			100	03		03
BVP1005	Plumbing Lab I		02			50	--	50		1.5	1.5
BVP1006	Plumbing Lab 2		02			50	--	50	--	1.5	1.5
BVP1007	On Job Training-I		18				100	100		15	15
Total		12	22	200	200	100	100	600	12	18	30
Course Code	Course Name	Teaching Scheme (Hrs/Wk)		Credits							
		Th	Pra	ISE	ESE	PR	OR	Total	TH	PR	Total
BVP2001	Tools, Measurements and Symbols used in Plumbing (TMSP)	03		50	50			100	03		03
BVP2002	Sanitary Drainage and Storm Drain Design (SDSDD)	03		50	50			100	03		03
BVP2003	Pipe, Joints, Valves Fixtures and Fittings in Plumbing (PJVFFP)	03		50	50			100	03		03
BVP2004	Entrepreneurship Development- II (ED-II)	03		50	50			100	03		03
BVP2005	Project-I		04			100	-	100		03	03
BVP2006	On Job Training-II		18				100	100		15	15
Total		12	22	200	200	100	100	600	12	18	30

**On Job Training should be carried out in any one subject per semester as per NSDC guidelines for following Skill Sets:** 1. Plumbing Services Technician 2. Plumbing layout 3. Plumbing Fittings 4.Plumbing Measurements

**Course Outcome: At the end of the course, the students are able to,**

- A. Study plumbing codes and good engineering practices.
- B. Coordinate plumbing works from inception to completion with Owners, Architects, other consultants and contractors.
- C. Select proper plumbing materials and systems.
- D. Read and interpret plumbing drawings.
- E. Supervise code based plumbing installations.

## Semester - I

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1001 : Introduction to Plumbing, Codes and Standards in Plumbing		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>03</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Introduction to Plumbing, Codes and Standards in Plumbing:</b> <b>Unit 1:</b> Introduction, Role of Plumbing, definition of Plumbing. Sanitary work details, application of plumbing. Plumbing In industry field. <b>Unit 2:</b> Introduction in Plumbing for solar system. Plumbing for medical field , Plumbing for Hot and Cold Water System in residential & commercial buildings. <b>Unit 3:</b> Codes and Standards: Scope, purpose; codes and standards in the building industry, UIPC-I, NBC and other codes, Local Municipal Laws, approvals, general regulations, standards related to plumbing. <b>Unit 4:</b> Water supply, sewerage system, drainage system, workmanship, water conservation, protection of pipes and structures, waterproofing. <b>Unit 5:</b> Provisions for plumbing systems, coordination during the planning stage, various agencies involved and their roles, space planning for plumbing systems, water tanks, pump room <b>Unit 6:</b> Centralized hot water systems, toilet locations, water treatment, sewage treatment, toilet planning, plumbing shafts, basements and terraces planning. Structural parameters, sunken toilets, location of columns and beams, post tension slabs, importance of ledge walls, water proofing.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1002 : Introduction to Plumbing Material & Terminologies in Plumbing.		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>03</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Introduction to plumbing material &amp; Terminologies in Plumbing:</b> <b>Unit 1:</b> Plumbing Materials, Sealing Material, Plumber's Putty, Sealing Adhesives. <b>Unit 2:</b> Plumbing Pipes, Types of plumbing pipes. Chlorinated PVC (CPVC) pipes. Polypropylene pipes, PEX or XLP, Un plasticized Polyvinyl pipes. <b>Unit 3:</b> Definitions, use/purpose of the following, Plumbing Fixtures: accessible, readily accessible, aerated fittings, AHJ, bathroom group, carrier, flood level rim, floor sink, flushometer valve, flush tanks, plumbing appliances, plumber <b>Unit4:</b> Definitions, use/purpose of the following, Drainage: adapter fitting, adjusted roof area, AAV, air break, air gap, area drain, base, bell and spigot joint, building drain, branch, DFU, grease interceptor, joints, roof drain, smoke test, stack. <b>Unit 5:</b> Definitions, use/purpose of the following, Water supply: angle valve, anti-scald valve, backflow, bypass, check valve, cross connection, ferrule, gate valve, gray water, joints, PRV <b>Unit 6:</b> Pipe Laying domestic water supply and drainage systems.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1003: Introduction to Plumbing & Pumping Systems		
Teaching Scheme: TH : 3Hrs./Week	Credits 03	Examination Scheme: In-Semester Exam: 50 Marks End-Semester Exam: 50 Marks
Course Contents		
<b>Introduction to Plumbing System Pumping Systems :</b> <b>Unit 1:</b> Introduction plumbing system. Components of plumbing system. Internal plumbing system. <b>Unit 2:</b> External plumbing system, Durability and maintenance of Plumbing systems. Advantages and disadvantage of Plumbing system <b>Unit 3: Pumping System:</b> Pump heads, types of Pumps, applications, pump selection, pump characteristics, pumps and motors. <b>Unit 4:</b> Pump efficiency, motor efficiency, Hydro Pneumatic Systems (HPS) <b>Unit 5:</b> Zoning, Storm Water and Drainage Pumps. <b>Unit6:</b> Introduction to starters and control panels.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1004 :Entrepreneurship Development- I		
Teaching Scheme: TH : 3Hrs./Week	Credits 03	Examination Scheme: In-Semester Exam: 50 Marks End-Semester Exam: 50 Marks
Course Contents		
<b>Entrepreneurship Development- I:</b> <b>Unit1:</b> Definition and introduction of Entrepreneurship development. <b>Unit2:</b> Definition Entrepreneur, Characteristics of Entrepreneur, Classification of Entrepreneurship, Types of Entrepreneurs. <b>Unit3:</b> Incorporation of Business and Forms of Business organizations, forms of business entities in India. <b>Unit4:</b> Role of entrepreneurship in economic development and start ups. <b>Unit5:</b> Ideas in Entrepreneurships, Sources of New Ideas, Techniques for generating ideas. <b>Unit6:</b> Opportunity Recognition – Steps in tapping opportunities.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1005 :Plumbing Lab- I		
Teaching Scheme: PR : 2Hrs./Week	Credits 1.5	Examination Scheme: PR: 50 Marks
Course Contents		
<b>Plumbing Lab I:</b> <b>All assignment are compulsory</b> 1. Drawings of types of pipe joints. 2. Draw sheet showing details of at least two plumbing fixtures 3. Draw the line plan of any one residential building G+1 showing water supply systems. 4. Site Visit : Any on-going Construction Site (visit report should contain: details of the project, stage of construction, sketches of components with cross section & dimensions, materials used and site plan, etc.) Prepare Visit Report 5. Collect at least six brochures various types of piping materials used in water supply systems, Pipe fittings, type of fittings, collar, elbow, gasket, union, reducer, tee, nipple, trap, plumbing fixtures from market 6. Layout/ Site plan indicating drainage line (with area statement, make max. four students in one group). 7. Poster on pipeline distribution system by taking any case study		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1006: Plumbing Lab- 2		
Teaching Scheme: PR : 2Hrs./Week	Credits 1.5	Examination Scheme: PR: 50 Marks
Course Contents		
<b>Plumbing Lab 2:</b> <b>All assignment are compulsory</b> 1. Prepare culvert Design. 2. Prepare market survey on Safety & contamination prevention system. 3. Design Minor drainage system for any site. 4. Poster on six major elements in drain, waste & venting system, 5. Site visit to study Water Heating system / Fuel Storage Equipment/ Energy-efficient water heating. Prepare visit report on it. 6. Design storm drain pipe systems.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP1007: On Job Training-I		
Teaching Scheme: PR: 18 Hrs./Week	Credits 15	Examination Scheme: OR: 100 Marks
Course Contents		
<b>On Job Training –I</b> <b>On Job Training should be carried out in any one subject per semester as per NSDC guidelines for following Skill Sets:</b> 1. Plumbing Services Technician 2. Plumbing layout 3. Plumbing Fittings 4.Plumbing Measurements		

## Semester – II

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP2001: Tools, Measurements and Symbols used in Plumbing.		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>3</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Tools, Measurements and Symbols used in Plumbing:</b> <b>Unit1:</b> Introduction to plumbing tools, major tools used in plumbing, Holding Tools, Bench vice, Pipe vice. <b>Unit2:</b> Fitting Tools Wrenches, Adjustable wrench, Water-pump plier Spanners, Ring spanners, Open-ended spanners, Combination spanners, Bi-hexagonal ring spanner, <b>Unit3:</b> Cutting Tools, Pipe bending tools, Other Tools used in plumbing. <b>Unit4:</b> Introduction plumbing measurement, Measurement of Length. Measurement of Weight, Length Conversion, Measurement of Volume. Measurement of Pressure, Measurement of Density. <b>Unit5:</b> Measuring Instruments, Measuring tools used in plumbing. <b>Unit6:</b> Importance of plumbing symbols. Detailing of plumbing system by using plumbing symbols.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP2002: Sanitary Drainage and Storm Drain Design		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>3</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Sanitary Drainage and Storm Drain Design:</b> <b>Unit1:</b> One pipe and two pipe systems, different pipe materials and jointing methods, special joints, hangers and supports, protection of pipes and structures. <b>Unit2:</b> Alternative materials, workmanship, prohibited fittings and practices, hydraulic jump, change in direction of flow, T and Y fittings, cleanouts, pipe grading. <b>Unit3:</b> Fixtures below invert level, suds relief, testing, building sewers, trenching, testing, sumps and pumps, introduction to Drainage Fixture Units (DFU) and sizing of horizontal and vertical pipes. <b>Unit4:</b> Storm drain required, prohibited connections, subsoil drains, sub-drains, gutters, channels or scuppers <b>Unit5:</b> Roof drains, strainers, leaders, conductors and connections, catchment, collect/capture storm water, discharging storm water sizing case study as per NBC, safety, traps required, prohibited installations. <b>Unit6:</b> Rain Water Harvesting (RWH) definition, need, catchment, conduits, settlement tanks, treatment, possible uses, recharging pits, advantages of RWH.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP2003: Pipe, Joints, Valves Fixtures and Fittings in Plumbing		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>3</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Unit 1:</b> Introduction of pipe fitting, joints and valves, Pipe Fittings, Type of Fittings, Elbow, Gasket, Union, Reducer, Tee, Nipple, Trap, Cross, Offset, Laying of GI Pipes in Buildings, Pipe Joints, Types of pipe joints, Valves. <b>Unit 2:</b> Definitions of plumbing fixtures, fittings, appliances and appurtenances; maximum flow rates, water closets, urinals, flushing devices. <b>Unit3:</b> Plumbing fixtures, fittings for washbasins, bath/shower, kitchen sinks, water coolers. <b>Unit4:</b> Plumbing fixtures, fittings for clothes washer, dish washer, mop sink, overflows, strainers etc. <b>Unit 5:</b> Plumbing fixtures, fittings for floor drains, floor slopes, location of valves, hot water temperature controls. <b>Unit6:</b> Installation standard dimensions of Plumbing Fixtures and Fittings in plan and elevation for residential & commercial buildings.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP2004: Entrepreneurship Development- II		
<b>Teaching Scheme:</b> <b>TH : 3Hrs./Week</b>	<b>Credits</b> <b>3</b>	<b>Examination Scheme:</b> <b>In-Semester Exam: 50 Marks</b> <b>End-Semester Exam: 50 Marks</b>
Course Contents		
<b>Entrepreneurship II:</b> <b>Unit1:</b> Institutions Supporting Small Business Enterprises. <b>Unit2:</b> Central Level Institutions: NABARD; SIDBI, NIC,KVIC, SIDO, NSIC Ltd etc., <b>Unit3:</b> State level Institutions, DICs, SFC, SSIDC, <b>Unit4:</b> Other financial assistance, Government Policy and Taxation Benefits, <b>Unit5:</b> Government Policy for SSIs, tax incentives and concessions, Non-tax concessions, <b>Unit6:</b> Rehabilitation and Investment Allowances.		

Savitribai Phule Pune University		
First Year B-VOC Plumbing (2020 Course)		
BVP2005: Project -I		
<b>Teaching Scheme:</b> <b>PR : 4Hrs./Week</b>	<b>Credit</b> <b>3</b>	<b>Examination Scheme:</b> <b>PR:100 Marks</b>
Course Contents		
<b>Project:</b> On the basis of learning in the Bachelor of Vocational, a project to be taken up by the student strengthening his/ her vocational skills		



<b>Savitribai Phule Pune University</b>		
<b>First Year B-VOC Plumbing (2020 Course)</b>		
<b>BVP2006: On Job Training -II</b>		
<b>Teaching Scheme:</b> <b>PR : 18 Hrs./Week</b>	<b>Credits</b> <b>15</b>	<b>Examination Scheme:</b> <b>OR:100 Marks</b>
<b>Course Contents</b>		
<b>On Job Training : <u>On Job Training should be carried out in any one subject per semester as per NSDC guidelines for following Skill Sets:</u></b>		
<b><u>1. Plumbing Services Technician 2. Plumbing layout 3. Plumbing Fittings 4.Plumbing Measurements</u></b>		

**Reference books and codes:**

- Uniform Illustrated Plumbing Code-India (UIPC-I) published by IPA and IAPMO(India).
- National Building Code (NBC) of India.
- IS 17650 Part 1 and Part 2 for Water Efficient Plumbing Products & Water Efficient Products-India (WEP-I) published by IPA and IAPMO (India).
- Water Efficiency and Sanitation Standard (WE.Stand) published by IPA and IAPMO(India) Water Pollution, Berry, CBS Publishers.
- ‘A Guide to Good Plumbing Practices’, a book published by IPA.
- Elements of Water Pollution Control Engineering, O.P. Gupta, Khanna, Book Publishing, New Delhi.