

Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"



Course Contents / Lesson Plan

Course Title: Plumber & Pipe fitter

Duration: 06 Months

Trainer Name	
Author Name	Faisal Hayat Khan (Lecturer Civil KP-TEVTA)
Course Title	PLUMBER & PIPE FITTING
Objectives and Expectations	<p>Employable skills and hands-on practice in PLUMBING TRADE</p> <p>This course offers a broad, cross-disciplinary learning experience for students looking to pursue careers in plumber trade, and all disciplines that focus on effective Safety awareness, variety of tools and equipment such as hand and power tools, welding and soldering/brazing equipment, and hoisting and lifting equipment to perform the tasks in their trade.</p> <p>In this course, students may be employed by plumbing/mechanical contractors, service companies, and maintenance departments of manufacturing, commercial, health care and educational facilities. They may also be self-employed. Plumbers install piping and equipment in residential, commercial, institutional and industrial buildings and sites.</p> <p><u>Main Expectations:</u></p> <p>In short, the course under reference should be delivered by professional instructors in such a robust hands-on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion.</p> <p>This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market-centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each trainee to prepare them for such market roles during/after the training.</p> <ol style="list-style-type: none"> <li data-bbox="427 1346 1500 1599">i. Specifically designed Practical Tasks to be performed by trainees are included in Annex I of this document. The management of the training institution must keep records of all tasks performed individually or collectively, clearly identifying names, industries, courses, etc. for physical inspection/verification through supervisory visits at any time. Weekly assignments are also noted in the weekly lesson plans given in this document. <li data-bbox="427 1599 1500 1966">ii. A module on workplace ethics is also included to emphasize the importance of good and positive behavior in the workplace, in line with best practice elsewhere in the world. An overview of these qualities is given in the appendix to this document. Its importance should be conveyed in a form that is engaging and interesting to trainees such as plumber diagnosis and problem solving. They decide on priorities and plan and organize work accordingly. A plumber may determine the most cost-effective way to use materials and supplies when installing plumbing and heating systems

iii. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of the Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

iv. To maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational Lectures
- Success Stories
- Case Studies

These techniques would be employed as an additional training tool wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and a proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem-solving abilities of the trainees.

v. **Motivational Lectures**

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture to inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic FVTLM022 Page 4 role & responsibilities as a Pakistani. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity and spark the desire needed for trainees to want to learn more. Impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for longer time without boredom and loss of interest because they can clearly see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 - 10 years) and long term (more than 10 years). As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

(i) **Success Stories**

Another effective way of motivating the trainees is by means of Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till

the end of the training. A success story may be disseminated orally, through a presentation or by means of a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person FVTLM022 Page 5 achieved his goal through hard work, dedication and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehensible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. Optimum impact is created when the story is revealed in the form of:

- Directly in person (At least 2-3 cases must be arranged by the training institute)
- Through an audio/videotaped message (2-3 high quality videos must be arranged by the training institute)

It is expected that the training provider would collect relevant high quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.

(ii) Case Studies

Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real-life specific problem/situation and to explore the solutions. In simple terms, the case study method of teaching uses a real-life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes class room atmosphere interesting thus maintaining the trainee interest in training till the end of the course. Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies to be presented to the trainees. The trainer may adopt a power point presentation or video format for FVTLM022 Page 6 such case studies whichever is deemed suitable but it's important that only those cases are selected that are relevant and of a learning value. The Trainees should be required and supervised to carefully analyze the cases. For the purpose they must be encouraged to inquire and collect specific information data, actively participate in the discussions and intended solutions of the problem situation. Case studies can be implemented in the following ways:

- i. A good quality trade specific documentary (At least 2-3 documentaries must be arranged by the training institute)
- ii. Health & Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute)
- iii. Field visits (At least one visit to a trade specific major industry/ site must be arranged by the training institute)

Entry-level of trainees

Primary

Learning Outcomes of the course	<p>By the end of this course, students will be able to:</p> <p>Demonstrate the activity of understanding and interpreting of the plumbing drawings / layout, marking, dimensions and site plan</p> <p>Demonstrate logical reasoning in plumbing through evaluating best materials selection and determine adequate joining processes.</p> <p>Demonstrate plumbing technology through using current plumbing tools.</p> <p>Communicate effectively by discussing plumbing fittings with industry names, classifying materials using industry standard terms and explaining plumbing processes utilizing appropriate terminology.</p> <p>Demonstrate professionalism by developing goals for personal and professional growth & modeling industry norms to develop a. commitment of lifelong career</p>
Course Execution Plan	<p>The total duration of the course: 6 months (24 Weeks)</p> <p>Class hours: 4 hours per day</p> <p>Theory: 20%</p> <p>Practical: 80%</p> <p>Weekly hours: 20 hours per week</p> <p>Total contact hours: 480 hours</p>
Companies offering jobs in the respective trade	<p>The following public and private companies can offer jobs in the trade: Health department, Construction companies, Housing projects, Process Plants, Oil mills, flour mills, Petrol & CNG stations and townships etc.</p>
Job Opportunities	<p>The passed out can work as:- □ Plumber in industry (Construction, Textile, Leather, Pharmaceuticals, Food Processing, Automotive, Cement etc.) Owner of Self-Business</p>
No of Students	<p>25</p>
Learning Place	<p>Classroom / Lab / Workshop / Industry</p>
Instructional Resources	<p>By the end of the course the trainees will be able to have following competencies and skills.</p> <ul style="list-style-type: none"> □ Identify the skills needed to use plumbing tools on the common types of plumbing and piping systems, as well as the applicable codes, standards, and licensing procedures □ List how to select and use the proper tools for various tasks, perform computations, interpret architectural drawings, disinfect water, use plumbing valves and meters, and differentiate the installation procedures for the types of heating systems □ Describe the basics of plumbing system design, calculating required pipe lengths and system dimensions, scheduling work, installing DWV and supply piping, system testing, and doing finish work □ Identify equipment and methods for working with specialized plumbing systems, doing service work, and performing calculations

Scheduled Weeks	Module Title	Days	Learning Units	Home Assignment
Week 1	Introduction & Performs Common Occupational Skills	Day 1	Course Introduction & Motivational Lecture <ul style="list-style-type: none"> • Work ethic • Purpose of the course • Job Reasoning work & Safety 	
		Day 2	Organizes Work / Work ethics Trade Relate Safety <ul style="list-style-type: none"> • Discuss safe work practices • Toolbox Talks (TBT) • Lockout and tag out procedures • Maintains safe work environment • safe work practices • regulatory requirements pertaining to workplace safety 	
		Day 3	Uses personal protective equipment (PPE) and safety equipment. <ul style="list-style-type: none"> • PPE and safety equipment, its applications, maintenance and procedures for use • regulatory requirements pertaining to PPE and safety equipment. • Performs lock-out and tag-out procedures regulations, applications and procedures for locking out equipment 	
		Day 4	Introduction to Drawing <ul style="list-style-type: none"> • explain drawings • use of symbols • discuss measurements and standards • explain Iso-metrics / Layouts • draw single line plan for execution of the work required. <p>Uses communication techniques</p> <ul style="list-style-type: none"> • trade terminology effective communication practices 	
		Day 5	Basic Tools and Equipment	

			<ul style="list-style-type: none"> • discuss the use and care of hand and power tools • discuss access equipment • explain hoisting and rigging equipment • explain crane hand signals • discuss knots and hitches • describe welding equipment • explain soldering and brazing equipment 	
Week 2	Organizes work	Day 1	Motivational Lecture Students are introduced to how Organizes their work	
		Day 2	Piping Fundamentals Theory discuss piping system layout discuss piping system measurements explain piping system offsets	
		Day 3	Piping Fundamentals Theory identify pipe support systems discuss pipe sleeves	
		Day 4	Piping Fundamentals Theory define piping system commissioning discuss piping system protection	
		Day 5	Piping Fundamentals Theory Purpose of measuring and checking tools. Accuracy of measuring.	
Week 3	Basics of plumbing and piping shop	Day 1	Piping Fundamentals-Shop <ul style="list-style-type: none"> • discuss assembly of copper tube and tubing • discuss assembly of PPRC Pipes • discuss assembly of plastic tube and its tubing 	
		Day 2	Piping Fundamentals-Shop <ul style="list-style-type: none"> • discuss assembly of steel pipe • discuss installation of hybrid piping system 	
		Day 3	Trade Activities <ul style="list-style-type: none"> • Piping system layout • Calculation of pipe. • Calculation of tube and its lengths • Calculation of piping offsets 	

		Day 4	Trade Activities <ul style="list-style-type: none"> • Installation of piping supports • Installation of sleeves
		Day 5	Trade Activities <ul style="list-style-type: none"> • Linear measurements instruments • Linear measurements and its fault • Care and maintenance of measuring instruments.
Week 4		Day 1	Commissions Systems <ul style="list-style-type: none"> • Protects piping systems, equipment and structure from damage • Coordinates excavation and backfilling of trenches
		Day 2	Commissions Systems <ul style="list-style-type: none"> • Installs fire stopping devices and materials • Countersinking • Counterboring
		Day 3	Uses Communication Techniques <p>Communication Techniques</p> <ul style="list-style-type: none"> • trade terminologies • effective communication practices
		Day 4	Use mentoring techniques <p>Technical drawings Lettering exercise Types of lines</p>
		Day 5	Dimensions <p>Dimension symbols. Various pipe and fitting symbols</p>
Week 5	Preparation and Assembling	Day 1	Pipe Preparation <ul style="list-style-type: none"> • Inspects tube, tubing, pipe and fittings before installation • Accessories to be used • Procedures used to measure tube, tubing and piping, and fitting allowance
		Day 2	Cuts <ul style="list-style-type: none"> • procedures used to measure cut tube, tubing and pipe. • Accessories for cutting Bends <ul style="list-style-type: none"> • Procedures used to measure bend tube, tubing and pipe. • Accessories for bending

		Day 3	Pipe connections <ul style="list-style-type: none"> • Procedures used to measure connection tube, tubing and pipe. • Accessories for pipe connections 	
		Day 4	Sawing <p>Cutting principles Types of saw blades and its characteristics</p>	
		Day 5	Drilling <p>Drilling through holes Main parts Clamping Drilling faults</p>	
Weeks 6	Pipe fitting	Day 1	Steel pipe <p>Kinds of steel pipes Normal sizes and its lengths</p>	
		Day 2	Pipe fittings <p>Pressure and drainage fitting Fitting specifications</p>	
		Day 3	Characteristics of pipes <p>Properties Rust / Corrosion Chemical resistance Expansion / Heat Resistance</p>	
		Day 4	Characteristics of pipes <p>Advantages and disadvantages Comparative analysis</p>	
		Day 5	Plumbing symbols <p>Importance of pipes symbols Symbols definitions</p>	
Week 7	Pipe fitting	Day 1	Pipe Threads <p>BSP Threads Threads and tappers and angles Thread engagement Threads per inch</p>	
		Day 2	Joints <p>Joining methods of steel pipes Joining methods of cast iron pipes</p>	
		Day 3	Joints <p>Joining methods of copper pipes Joining methods of plastic and A.C pipes</p>	
		Day 4	Supporting of pipes <p>Hanger and devices Position and alignment Corrosion protection</p>	
		Day 5	Pipes fitting exercise <p>Measuring Marking Cutting</p>	
Week 8	Installs, tests and services sewers, sewage treatment systems and drainage, waste and vent (DWV) systems	Day 1	Plumbing Codebook <ul style="list-style-type: none"> • explain drainage piping components • explain dry venting 	

			<ul style="list-style-type: none"> • explain wet venting 	
		Day 2	Plumbing Codebook <ul style="list-style-type: none"> • size drainage, waste and venting(DWV) line drawings • discuss rough-in requirements install bathroom rough-in.	
		Day 3	Interior Drainage, Waste and Venting (DWV) Systems (Introduction) <ul style="list-style-type: none"> • introduction to DWV • Sizes pipe for interior drainage,waste and vent (DWV) systems 	
		Day 4	DWV systems <ul style="list-style-type: none"> • DWV systems, their components, • DWV system applications and operation 	
		Day 5	DWV systems <ul style="list-style-type: none"> • procedures used to determine and transfer grade and elevation measurements for DWV systems 	
Week 9	Installs, tests and services sewers, sewage treatment systems and drainage, waste and vent (DWV) systems	Day 1	Installs underground piping and components for interior drainage, waste and vent (DWV) systems <ul style="list-style-type: none"> • DWV systems, applications and operation • procedures used to determine and transfer grade and elevation measurements for DWV systems 	
		Day 2	Procedures used to layout and install DWV systems	
		Day 3	Installs piping and components for interior drainage, waste and vent (DWV) systems above ground <ul style="list-style-type: none"> • DWV systems, applications and operation • procedures used to determine and transfer grade and elevation measurements for DWV systems • procedures used to layout and install DWV systems 	
		Day 4	Tests interior drainage, waste and vent (DWV) systems <ul style="list-style-type: none"> • interior DWV systems and their application 	

			<ul style="list-style-type: none"> • testing equipment and procedures used for testing interior DWV systems 	
		Day 5	<p>Services piping and components for interior drainage, waste and vent (DWV) systems</p> <ul style="list-style-type: none"> • interior DWV system equipment and components, their applications and operation • procedures used to service interior DWV systems 	
Week 10	Gas fittings	Day 1	<p>Students are introduced to use the various plumbing tools in Gas distribution</p> <p>Installs, tests and services gas services</p>	
		Day 2	<p>Gas Fittings</p> <ul style="list-style-type: none"> • explain the delivery system for natural and propane gases • discuss the properties of natural, propane and butane gases 	
		Day 3	<p>Gas Fittings</p> <ul style="list-style-type: none"> • explain gas codes • install a natural gas piping system commission a natural gas piping system 	
		Day 4	<p>Gas fitting layouts</p> <ul style="list-style-type: none"> • layout gas distribution piping system • layout the venting system 	
		Day 5	<p>Gas fitting layouts</p> <ul style="list-style-type: none"> • apply manufacturers guidelines for furnace positioning. • perform start up procedures 	
Week 11	Introduction to electric controls	Day 1 and 2	<p>Electric Controls</p> <ul style="list-style-type: none"> • describe basic electrical concepts. • measure voltage, current, resistance and capacitance. • interpret wiring diagrams. • test standing pilot appliance controls terminate wires. 	
		Day 3,4,5	<p>Electric Controls (Exceed)</p> <ul style="list-style-type: none"> • test the operation of electrical circuits • describe the operation of electrical switches 	

			<ul style="list-style-type: none"> • use electrical transformers • use relays in electrical circuits <p>compare the characteristics for alternating current (AC) motors</p>	
Week 12	Installs, Tests and Services Hydronic Systems	Day 1	Students are introduced to: Installs, Tests and Services Hydronic Systems	
		Day 2	Hydronic Systems <ul style="list-style-type: none"> • discuss pump sciences • calculate circulator requirements • explain radiant heating concepts • discuss piping strategy for multitemperature applications 	
		Day 3	Hydronic Systems <ul style="list-style-type: none"> • discuss design requirements for radiant panel heating systems • recognize control systems <p>discuss hydronic heating and cooling distribution piping</p>	
		Day 4	Sizes piping and components for hydronic systems <ul style="list-style-type: none"> • fluid fundamentals • factors that impact the design sizing pipe • components for hydronic systems 	
		Day 5	Installs piping and components for hydronic systems <ul style="list-style-type: none"> • installing piping and components for hydronic systems 	
Week 13	Installs, Tests and Services Hydronic Systems	Day 1	Tests piping and components for hydronic systems <ul style="list-style-type: none"> • testing piping and components for hydronic systems • principles of hydronic system operation 	
		Day 2	Services piping and components for hydronic systems <ul style="list-style-type: none"> • principles of hydronic system operation • servicing piping and components for hydronic systems 	
		Day 3	Blueprint Reading and Plumbing Code Introduction to Blueprint Reading	

		Day 4	Interpretation of plumbing code for drainage, waste, and venting systems	
		Day 5	Establishment of elevation and understanding isometric views	
Week 14	Installs, Tests And Services Hydronic Heating And Cooling Generating Systems	Day 1	Various fields of Installation, Tests And Services Hydronic Heating And Cooling Generating Systems	
		Day 2	Installs hydronic heating generating systems <ul style="list-style-type: none"> • hydronic heat sources and their operation 	
		Day 3	Installs hydronic cooling generating systems <ul style="list-style-type: none"> • principles of heat transfer hydronic cooling sources and their operation 	
		Day 4	Tests hydronic heating and cooling generating systems <ul style="list-style-type: none"> • testing hydronic heating and cooling sources 	
		Day 5	Operation of hydronic heating and cooling generating systems their operation interpreting manufacturers' data	
Week 15	Installs, Tests And Services Hydronic Heating And Cooling Generating Systems	Day 1	Services hydronic heating and cooling generating systems <ul style="list-style-type: none"> • the principles of hydronic heating and cooling generating systems operation 	
		Day 2	Services hydronic heating and cooling generating systems <ul style="list-style-type: none"> • servicing for hydronic heating and cooling generating systems 	
		Day 3	Documenting the service for hydronic heating and cooling generating systems and associated piping and components	
		Day 4	Installs, tests and services hydronic system controls and transfer units <ul style="list-style-type: none"> • Installs hydronic system controls • Installs hydronic transfer unit 	

		Day 5	Installs, tests and services hydronic system controls and transfer units <ul style="list-style-type: none"> • Tests hydronic system controls and transfer units • Services hydronic system controls and transfer units
Week 16	Plumbing Systems	Day 1	Introduction <ul style="list-style-type: none"> • Business Value Statement • Business Model Canvas • Sales and Marketing Strategies • How to Reach Customers
		Day 2	Plumbing Systems <ul style="list-style-type: none"> • describe commercial plumbing fixtures • recognize cross connection control devices • explain potable hot water distribution systems
		Day 3	Plumbing Systems <ul style="list-style-type: none"> • size potable water distribution systems • discuss municipal infrastructures • discuss medical gas systems
		Day 4	Plumbing Systems <ul style="list-style-type: none"> • explain radon gas prevention systems • discuss compressed air systems
		Day 5	Plumbing Systems <ul style="list-style-type: none"> • discuss underground sprinkler systems • discuss swimming pools describe special piping systems
Week 17	Plumbing Systems	Day 1	Sizes pipe for sewers <ul style="list-style-type: none"> • sanitary drainage, storm and combination drainage systems, their components, applications and operation
		Day 2	Sizes pipe for sewers procedures used to determine and transfer grade and elevation measurements for sanitary drainage systems
		Day 3	Installs Manholes and Catch Basins <ul style="list-style-type: none"> • manholes and catch basins, their components, applications

			<p>and operation</p> <ul style="list-style-type: none"> • procedures used to determine and transfer grade and elevation measurements for manholes and catch basins • procedures used to lay out and install manholes and catch basins 	
		Day 4	<p>Installs piping for sewers</p> <ul style="list-style-type: none"> • sewers, their components, applications and operation • procedures used to determine and transfer grade and elevation 	
		Day 5	<p>Installs piping for sewers</p> <ul style="list-style-type: none"> • measurements for sewers • procedures used to lay out and install piping for sewers 	
Week 18	Tests Manholes, Catch Basins and Piping For Sewers	Day 1	<p>Perform tools demonstration for tests Manholes, Catch Basins and Piping For Sewers</p>	
		Day 2	<p>Tests manholes, catch basins and piping for sewers</p> <ul style="list-style-type: none"> • manholes, catch basins and piping for sewers and their application 	
		Day 3	<ul style="list-style-type: none"> • procedures used for testing manholes, catch basins and piping for sewers • Services manholes, catch basins and piping for sewers 	
		Day 4	<p>Installs, tests and services water services Sizes pipe for water services</p> <ul style="list-style-type: none"> • water service piping, components, their applications and operation • procedures used to determine elevation, friction loss, velocity and required pressure for water service 	
		Day 5	<p>Installs piping for potable water distribution systems</p> <ul style="list-style-type: none"> • potable water distribution system and components, their applications and operation 	
Week 19	Tests Manholes, Catch Basins and Piping For Sewers	Day 1	<p>Procedures used to install piping and components for potable water distribution systems</p>	
		Day 2	<p>Installs, tests and services water services</p> <ul style="list-style-type: none"> • Sizes pipe for water services • Installs piping for water services 	

			<ul style="list-style-type: none"> • Installs water service equipment 	
		Day 3	<ul style="list-style-type: none"> • Tests water service piping and components • the procedures used to maintain water service 	
		Day 4	<p>Introduction to Advanced Plumbing Techniques</p> <p>Overview of advanced plumbing techniques and their applications Discussion on the importance of continued learning in the plumbing industry</p>	
		Day 5	<p>Pipe Rehabilitation Methods</p> <p>Introduction to pipe rehabilitation techniques such as pipe bursting and relining Hands-on demonstration of pipe rehabilitation equipment</p>	
Week 20	Advanced Plumbing Techniques	Day 1	<p>Advanced Pipe Joining Techniques</p> <p>Training on advanced pipe joining methods including fusion welding and threading Safety precautions and regulatory requirements for advanced pipe joining</p>	
		Day 2	<p>Water Treatment Systems</p> <p>Understanding the principles of water treatment and purification</p> <p>Installation and maintenance of water treatment systems in plumbing applications</p>	
		Day 3	<p>Advanced Plumbing Fixtures</p> <p>Overview of advanced plumbing fixtures such as water-saving toilets and smart faucets</p> <p>Installation and troubleshooting of advanced plumbing fixtures</p>	
		Day 4	<p>Greywater Recycling Systems</p> <p>Understanding greywater recycling systems and their benefits Installation and maintenance of greywater recycling systems</p>	
		Day 5	<p>Rainwater Harvesting Systems</p> <p>Introduction to rainwater harvesting techniques for residential and commercial buildings Design and installation</p>	

			considerations for rainwater harvesting systems	
Week 21	Plumbing Regulations and Compliance	Day 1	Introduction to Plumbing Regulations Overview of local, national, and international plumbing codes and regulations Importance of compliance with plumbing regulations in construction projects	
		Day 2	Code Interpretation and Application Interpretation of plumbing codes and standards for various plumbing systems Application of code requirements in plumbing design and installation	
		Day 3	Plumbing Inspections and Permits Understanding the process of plumbing inspections and obtaining permits Documentation and record-keeping requirements for plumbing projects	
		Day 4	Regulatory Updates and Continuing Education Staying informed about changes and updates in plumbing regulations	
		Day 5	Importance of continuing education and professional development for plumbers	
Week 22	Blueprint and Plumbing Code	Day 1	Motivational Lecture Introduction to blueprint reading and plumbing code	
		Day 2	Blueprint Reading and Plumbing Code <ul style="list-style-type: none"> • plumbing code for drainage, waste and venting • interpret code for sanitary drainage, storm drainage and venting • establish elevation with a builder's level • establish elevation with a laser level • isometric and orthographic views • plumbing systems grid lines	
		Day 3	Water Conditioning and Backflow <ul style="list-style-type: none"> • constituents of water • water tests • water treatment devices 	

			<ul style="list-style-type: none"> • water treatment equipment sizing component installation 	
		Day 4	Special Piping Systems <ul style="list-style-type: none"> • medical gas code • plastic welding • specialty tools • potable water distribution systemsizing • potable water distribution piping andcomponents • specialty piping systems andcomponents residential fire suppression systems 	
		Day 5	Trade Mathematics <ul style="list-style-type: none"> • basic math skills • units of measurement • offset calculations • grade calculations • heat calculations plumbing trade related calculations 	
Week 23	PROJECTION PLANS	Day 1	Motivational Lecture	
		Day 2	Introduction for projection plan	
		Day 3	Types of plans of projections	
		Day 4	Orthographic Projections	
		Day 5	1st And 3rd Angle Projections	
Week 24	Entrepreneurshipand Final Assessment in project	Day 1	Success stories Job Market SearchingSelf-employment Job Market Searching	
		Day 2	Introduction Fundamentals of Business Development Entrepreneurship Startup Funding	
		Day 3	Business Value Statement Business Model Canvas Sales and Marketing Strategies How to Reach Customers and EngageCEOs	
		Day 4	Stakeholders Power Grid RACI Model, SWOT Analysis, PESTAnalysis SMART Objectives Stakeholders Power Grid	

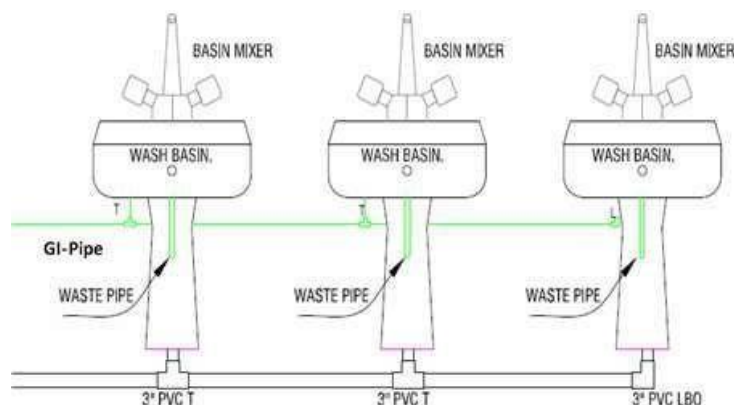
		Day 5	Cost Management (OPEX, CAPEX, ROCE, etc.) Final Assessment Cost Management (OPEX, CAPEX, ROCE, etc.) Final Assessment	
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Tasks For Plumber

Note: The following tasks are required to be performed multiple times by each trainee/group until sufficient proficiency level is acquired. The trainer is required to determine the number of times the task needs to be repeated by a trainee as per his/her low/medium/high level of skill and proficiency during any stage of the course.

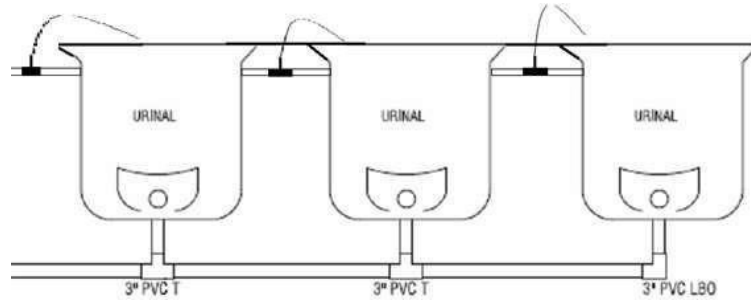
Task No.	Task	Description	Week
1.	Prepare safety charts	Showing General & Trade specific safety measure (text/pictorial). Each trainee will prepare different chart.	Week 1-5
2.	Apply basic numeracy	i. Find area of a circle having radius = 6cm, also convert the result into inches. ii. Find area of a square having each side = 3 inches, also convert the result into mm. iii. Find area of a triangle having height = 8.6 cm & base = 0.05m, also convert the result into inches. iv. Cylinder having height = 2.25ft & radius = 255mm, also convert the result into meters. (Note: Draw neat and clean sketches of all of the above on drawing sheet)	
3.	Drawing and estimate	Draw the layout of bathroom on drawing sheet and estimate the bathroom accessories for installation. Each trainees will prepare for different bathroom	
4.	Draw sketches of tools & equipment used by plumber	Draw neat & clean sketches of different tools & equipment used by a plumber. Each trainee will draw sketches of at least 10 items.	
5.	Pipe cutting	Practice on pipe cutting with saw and pipe cutter	
6.	Drilling hole	Practice on drilling hole	Week 6-12
7.	Practice on drill	Clamping and twisting the drill	
8.	Joints in Cast iron pipes	Practice on joints in cast iron pipes	
9.	Joints in Steel pipes	Practice on joints in steel pipes	
10.	Joints in Plastic and rubber pipes	Practice on joints in plastic and rubber pipes	
11.	Joints in PPRC and G.I pipes	Practice on joints in PPRC and G.I pipes	
12.	Threading in steel and cast-iron pipes	Practice on threading in steel and iron pipes	

13.	Threading on G.I And PPRC pipes	Threading in G.I and PPRC pipes	
14.	Connections for water supply	Connection of water supply from main line.	
15.	Install traps (Floor & Bottle trapes)	Install floor & bottle traps at appropriate places to drain waste water.	Week 13-16
16.	Installation of sewerage pipe	Install appropriate pipe for domestic sewerage system and connect/attach it to manhole.	
17.	Installation of drain system	Install kitchen sink drain system using appropriate material.	
18.	Drawing plumbing fittings	Draw neat sketches of plumbing fittings on drawing sheet, each trainee to draw at least 10 different sketches.	
19.	Perform cutting and threading	Take a thread 3.4 ft piece of 1 ¼ inches GI pipe and perform threading operation at both ends. Then connect an elbow at one end and a ½ inches reducer at the other end.	Week 16-20
20.	Install Indian/English WC	Install complete Indian/English WC and connect it to sewerage system properly, also enlist & demand all the necessary tool, equipment etc.	
21.	Installation of Instant Geeper	Install Instant Gas/Electric Geeper and connect it to water supply, also examine its performance.	
22.	Install washbasin hall	Install a washbasin hall as per below sketch. Also Enlist & demand Tools, Equipment & Accessories etc. to be used in this task.	



23.

Install urine hall

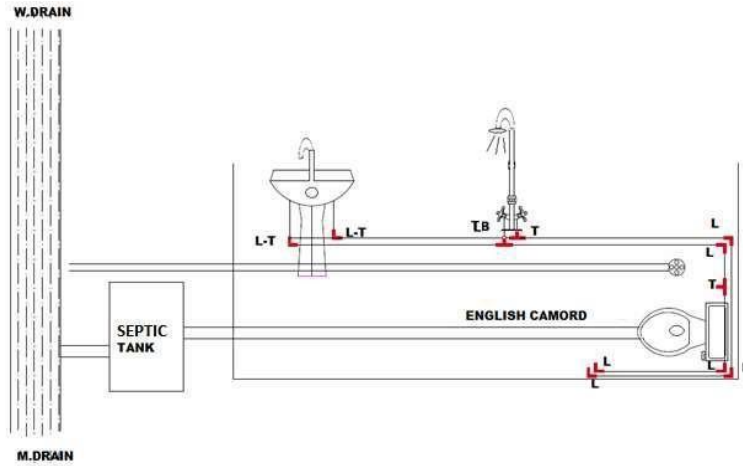


Week
20-24

24.

Double Bathroom
fitting

Install a double bathroom fittings as per below sketch. Also Enlist & demand Tools, Equipment & Accessories etc. to be used in this task. Use GI or PPRC pipe.



Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue or value to strengthen character and individual abilities. It is a set of values centered on importance of work and manifested by determination or desire to work hard. The following ten work ethics are defined as essential for employee's success:

1. **Attendance:** Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.
2. **Character:** Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.
3. **Appearance:** Dress for success, set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are, can last a life time
4. **Attitude:** Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems and procedures in light of changing responsibilities.
5. **Productivity:** Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your
6. **Organizational Skills:** Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Takes an appropriate approach to social interactions at work. Maintains focus on work responsibilities.
7. **Communication:** Written communication, being able to correctly write reports and memos. Verbal communications, being able to communicate one on one or to a group.
8. **Cooperation:** Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing workplace situations and the application of new or different skills.
9. **Respect:** Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions and suggestions

Suggestive Format and Sequence Order of Success Story

Note: Success story is a source of motivation for the trainees and can be presented in a number of ways/forms in a NAVTTC skill development course To call a passed out successful person of institute. He/she will narrate his/her success story to the trainees in his/her own words

meet trainees as well.

To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful person Audio video recording that has to cover the above mentioned points.

3. The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning per month etc) and narrates his/her story in teacher's own motivational words.

Sr	Key Information	Detail/Description
1	Self & Family Background	Self-introduction Family background and economic status, Education level and activities involved in Financial hardships etc
2	How he came on board NAVTTC Training/ or got trained through any other source	Information about course, apply and selection Course duration, trade selection Attendance, active participation, monthly tests, interest in lab work
3	Post Training Activities	How job / business (self-employment) was set up How capital was managed (loan (if any) etc). Detail of work to share i.e. where is job or business being done; how many people employed (in case of self employment/ business) □ Monthly income or earnings and support to family Earning a happy life than before
		Take the training opportunity seriously Impose self-discipline and ensure regularity Make Hard work pays in the end so be always ready for the same.

MOTIVATIONAL LECTURES LINKS.

TOPIC	SPEAKER	LINK
How to Face Problems In Life	Qasim Ali Shah	https://www.youtube.com/watch?v=OrQte08MI90
Just Control Your Emotions	Qasim Ali Shah	https://www.youtube.com/watch?v=JzFs_yJt-w
How to Communicate Effectively	Qasim Ali Shah	https://www.youtube.com/watch?v=PhHAQEGehKc
Your ATTITUDE is Everything	Tony Robbins Les Brown David Goggins Jocko Willink Wayne Dyer Eckart Tolle	https://www.youtube.com/watch?v=5fS3rj6eIFg
Control Your EMOTIONS	Jim Rohn Les Brown TD Jakes Tony Robbins	https://www.youtube.com/watch?v=chn86sH0O5U
Defeat Fear, Build Confidence	Shaykh Atif Ahmed	https://www.youtube.com/watch?v=s10dzfbozd4
Wisdom of the Eagle	Learn Kurooji	https://www.youtube.com/watch?v=bEU7V5rJTtw
The Power of ATTITUDE	Titan Man	https://www.youtube.com/watch?v=r8LJ5X2ejqU
STOP WASTING TIME	Arnold Schwarzenegger	https://www.youtube.com/watch?v=kzSBrJmXqdg
Risk of Success	Denzel Washington	https://www.youtube.com/watch?v=tbnzAVRZ9Xc

SUCCESS STORY

S. No	Key Information	Detail/Description
1.	Self & Family background	<p>Running my own plumbing company allows me the freedom to specialize in what I do best. I'm able to provide top quality service to my customers by taking on the jobs I've elected to train specifically for.</p> <p>Being my own boss also means having the ability to pick my own material and methods of installation. This all adds up to my ability to offer a high-end solution with long-term peace of mind. He says. If at first, you don't succeed, try try again</p>
2.	How he came on board NAVTTC Training/ or got trained through any other source	Certification in graphic designing from STEPS(NAVTTC partner institute)
3.	Post-training activities	<p>My dad is a plumber and would take me on jobs with him when I was a kid. As far back as I can recall, if I wasn't working, I was watching and learning.</p> <p>Eventually I went to work for him full time. I helped him build a larger business to provide for his family without him having to work before I started my own small company for myself. But he's had to face his fair share of challenges too. The shoddy state of internet infrastructure in his city, Mirpur, threatened to derail his freelancing career. "Sometimes I haven't had connectivity for two days straight," he explains. "That's unthinkable for someone who makes his livelihood on the internet."</p>
4.	Message to others (under training)	<p>Take the training opportunity seriously Impose self-discipline and ensure regularity Make Hard work pays in the end so be always ready for the same.</p>

Note: Success story is a source of motivation for the trainees and can be presented in several

ways/forms in a NAVTTC skill development course as under: -

1. To call a passed out successful trainee of the institute. He will narrate his success story to the trainees in his own words and meet trainees as well.
2. To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful trainee Audio-video recording that has to cover the above-mentioned points.*
3. The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning, etc) and narrates his/her story in the teacher's own motivational words.

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

1. Attendance:

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

2. Character:

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

3. Team Work:

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

4. Appearance:

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

5. Attitude:

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

6. Productivity:

Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. Organizational Skills:

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. Communication:

Written communication, being able to correctly write reports and memos.

Verbal communications, being able to communicate one on one or to a group.

9. Cooperation:

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

10. Respect:

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.