

# PIPE FITTER



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CBT Curriculum  
National Vocational Certificate Level 3

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## **Introduction**

### **Definition/ Description of the training program for Pipe Fitter Lev-3**

Pipe fitters are responsible for performing pipe work, in Light Engineering Sector especially for industry as well as at domestic level. While specific duties vary depending on the type of project, the duties of Pipe Fitter will include Installation of Pumps, Installation of Pipe Fixtures and Testing of Piping System. Also he/she will be able to Maintain Pipeline. The pipe fitter will be able to perform individually as well as in team work.

### **Purpose of the training program**

The purpose of the Pipe Fitter course is to engage young people with a program of development that will provide them with the knowledge, skills and understanding to start this career in Pakistan. Upon completion of this qualification, trainees will be ready to join the workforce with a healthy number of options in the manufacturing and light engineering sector.

### **Overall objectives of training program**

The overall objectives of the pipefitter program are:

- Managing a Plumbing Workshop (technically and economically)
- Selecting tools and equipment used to fabricate, joining and installing pipes
- Selecting tools, equipment's and consumables accurately according to Job specification
- Sequencing the different stages of preparation, development, fabrication and maintenance
- Working safely and professionally

### **Competencies to be gained after completion of course**

At the end of the course, the trainee must have attained the following competencies:

1. Apply Work Health and Safety Practices (WHS)
2. Identify and Implement Workplace Policy and Procedures
3. Communicate at Workplace
4. Perform Computer Application Skills
5. Manage Personal Finances
6. Install Pumps
7. Install Pipe Fixture
8. Test Piping System
9. Maintain Pipelines

### **Possible available job opportunities available immediately and later in the future**

Pipefitters are employed in the light engineering sector especially in construction sector. Experienced Pipefitters may advance through promotions with the same employer or by moving to more advanced positions with other employers. They can become:

- Plumber
- Pipe Fitter
- Pipe Fabricator (within limitations)
- Plumbing foreman
- Supervisor
- Managers

Some experienced Pipe Fitters achieve a highly respected level of salaries. There are good prospects for travel both within Pakistan and abroad. The employment outlook in this occupation will be influenced by a wide variety of factors including:

- Trends and events affecting overall employment (especially in the Construction industry)
- Location in Pakistan
- Employment turnover (work opportunities generated by people leaving existing positions)
- Occupational growth (work opportunities resulting from the creation of new positions that never existed before)
- Size of the industry
- Flexibility of the applicant (concerning location and schedule of work).

### **Trainee entry level**

Entry for assessment for this qualification is open. However, entry into formal training institute for this qualification is that the person having National Vocational Certificate level 2, in (Light Engineering Sector) “Pipefitter” with minimum middle (8 grade).

### **Minimum qualification of trainer**

Must hold at least level 4 qualification in Pipe Fitting; or

Diploma of Associate Engineer (DAE) with 3 years relevant work experience;

He/she should hold or be working towards a formal teaching qualification.

Other formal qualifications in the construction industry would be useful in addition to the above.

### **Recommended trainer: trainee ratio**

The recommended maximum trainer: trainee ratio for this program is 1 trainer for 20 trainees

### **Medium of instruction i.e. language of instruction**

Instructions will be in Urdu/English/Local language.

### **Duration of the course (Total time, Theory & Practical time)**

This curriculum comprises 9 modules. The recommended delivery time is 620 hours. Delivery of the course could therefore be full time, 5 days a week, for 6 months. Training providers are at liberty to develop other models of delivery, including part-time and evening delivery.

The full structure of the course is as follows:

| Module                                                           | Theory hours | Workplace hours | Total hours |
|------------------------------------------------------------------|--------------|-----------------|-------------|
| Module 1: Apply Work Health and Safety Practices (WHS)           |              |                 | 30          |
| Module 2: Identify and Implement Workplace Policy and Procedures |              |                 | 20          |
| Module 3: Communicate at Workplace                               |              |                 | 30          |
| Module 4: Perform Computer Application Skills                    |              |                 | 40          |
| Module 5: Manage Personal Finances                               |              |                 | 30          |
| Module 6: Install Pumps                                          | 35           | 115             | 150         |
| Module 7: Install Pipe Fixtures                                  | 25           | 95              | 120         |
| Module 8: Test Piping System                                     | 24           | 76              | 100         |
| Module 9: Maintain Pipelines                                     | 20           | 80              | 100         |

## Sequence of the modules

This qualification is made up of 9 modules. A suggested distribution of these modules is presented overleaf. This is not prescriptive and training providers may modify this if they wish.

5 modules are generic comprising, health & safety, workplace policies, communication, computer skills as well as finance knowledge which are essential skills to proceed in a professional environment.

Module 6: Install Pumps, covers various aspects related to installation of pumps that are required for the students to understand in order to work in a safe environment.

Module 7: Install Pipe Fixture; is relating to installation of a wide range of pipe fixtures that a Pipe fitter must learn and understand in order to become an effective professional. Module 8: Test Piping System and Module 9: Maintain Pipeline; these

are interdependent with the installation modules and need to be delivered in parallel. This is illustrated in the distribution table.

Each module covers a range of learning components. These are intended to provide detailed guidance to teachers (for example the Learning Elements component) and give them additional support for preparing their lessons (for example the Materials Required component). The detail provided by each module will contribute to a standardized approach to teaching, ensuring that training providers in different parts of the country have clear information on what should be taught. Each module also incorporates the industrial demand of Pakistan that make this qualification unique to Pakistan's industry needs.

The distribution table is shown below:

|                                                                                           |                                                                                                     |                                                                              |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Module 6:</b><br><br><b>Install Pumps</b><br><br>150 hours                             | <b>Module 7:</b><br><br><b>Install Pipe Fixture</b><br><br>120 hours                                | <b>Module 8:</b><br><br><b>Test Piping System</b><br>100 hours               |
|                                                                                           |                                                                                                     | <b>Module 9:</b><br><br><b>Maintain Pipelines</b><br>100 hours               |
| <b>Module 1:</b><br><br><b>Apply Work Health and Safety Practices (WHS)</b><br><br>30 hrs | <b>Module 2:</b><br><br><b>Identify and Implement Workplace Policy and Procedures</b><br><br>20 hrs | <b>Module 3:</b><br><br><b>Communicate at Workplace</b><br>30 hrs            |
|                                                                                           |                                                                                                     | <b>Module 4:</b><br><br><b>Perform Computer Application Skills</b><br>40 hrs |
|                                                                                           |                                                                                                     | <b>Module 5:</b><br><br><b>Manage Personal Finances</b><br>30 hrs            |



## Summary – overview of the curriculum

| Module Title and Aim                                                                                                                                                                                                                   | Learning Units                                                                                                                                                                                                                                                                                                        | Theory Days/hours | Workplace Days/hours | Timeframe of modules |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|----------------------|
| <b>Module 1: Apply Work Health and Safety Practices (WHS)</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to apply work health and safety practices (WHS)                     | <b>LU 1:</b> Implement safe work practices at work place<br><b>LU 2:</b> Participate in hazard assessment activities a work place<br><b>LU 3:</b> Follow emergency procedures at workplace<br><b>LU 4:</b> Participate in OHS consultative processes                                                                  |                   |                      | 30 Hrs               |
| <b>Module 2: Identify and Implement Workplace Policy and Procedures</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to identify and implement workplace policy and procedures | <b>LU 1:</b> Identify workplace policy & procedures<br><b>LU 2:</b> Implement workplace policy & procedures<br><b>LU 3:</b> Communicate workplace policy & procedures<br><b>LU 4:</b> Review the implementation of workplace policy & procedures                                                                      |                   |                      | 20 Hrs               |
| <b>Module 3: Communicate at Workplace</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to communicate at workplace                                                             | <b>LU 1:</b> Communicate within the organization<br><b>LU 2:</b> Communicate outside the organization<br><b>LU 3:</b> Communicate effectively in workgroup<br><b>LU 4:</b> Communicate in writing                                                                                                                     |                   |                      | 30 Hrs               |
| <b>Module 4: Perform Computer Application Skills</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to perform computer application skills                                       | <b>LU 1:</b> Prepare In-page documents as per required information<br><b>LU 2:</b> Prepare Spreadsheets as per required information<br><b>LU 3:</b> Use MS Office as per required information<br><b>LU 4:</b> Perform computer graphics in basic applications<br><b>LU 5:</b> Create Email account for communications |                   |                      | 40 Hrs               |

| Module Title and Aim                                                                                                                                                       | Learning Units                                                                                                                                                                                                                                                                                        | Theory Days/hours | Workplace Days/hours | Timeframe of modules |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|----------------------|
| <b>Module 5: Manage Personal Finances</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to manage personal finances | <b>LU 1:</b> Develop a personal budget<br><b>LU 2:</b> Develop long term personal budget<br><b>LU 3:</b> Identify ways to maximize future finances                                                                                                                                                    |                   |                      | 30 Hrs               |
| <b>Module 6: Install Pumps</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to install pumps                       | <b>LU 1:</b> Install mono-block pump<br><b>LU 2:</b> Install centrifugal pump<br><b>LU 3:</b> Install reciprocating pump<br><b>LU 4:</b> Install jockey pump<br><b>LU 5:</b> Install submersible pump<br><b>LU 6:</b> Install deep well pump<br><b>LU 7:</b> Install different kinds of booster pumps | 35 Hrs            | 115 Hrs              | 150 Hrs              |
| <b>Module 7: Install Pipe Fixtures</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to install pipe fixtures       | <b>LU 1:</b> Install pneumatic components<br><b>LU 2:</b> Install sanitary ware<br><b>LU 3:</b> Install hot water appliances<br><b>LU 4:</b> Install gas appliances<br><b>LU 5:</b> Install water storage tank                                                                                        | 25 Hrs            | 95 Hrs               | 120 Hrs              |
| <b>Module 8: Test Piping System</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to test piping system             | <b>LU 1:</b> Perform liquid penetration test<br><b>LU 2:</b> Perform hydrostatic test<br><b>LU 3:</b> Perform pneumatic test<br><b>LU 4:</b> Perform gravity test                                                                                                                                     | 24 Hrs            | 76 Hrs               | 100 Hrs              |

| Module Title and Aim                                                                                                                                          | Learning Units                                                                                                                                | Theory Days/hours | Workplace Days/hours | Timeframe of modules |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|----------------------|
| <b>Module 9: Maintain Pipelines</b><br><br><b>Aim:</b> The aim of this module is to develop advanced knowledge, skills and understanding to maintain pipeline | <b>LU 1:</b> Perform periodic and preventive maintenance<br><b>LU 2:</b> Perform breakdown maintenance<br><b>LU 3:</b> Install tracing system | 20 Hrs            | 80 Hrs               | 100 Hrs              |

## Modules

### Module 1: Apply Work Health and Safety Practices (WHS)

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to apply work health and safety practices (WHS)

**Duration:** 30 Hrs

**Theory:**

**Practical:**

| Learning Unit                                                         | Learning Outcomes                                                                                                                                                                                                                                                                                            | Learning Elements | Duration | Materials Required | Learning Place |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------------------|----------------|
| <b>LU 1:</b> Implement safe work practices at work place              | <b>The trainee will be able to:</b><br>Implement relevant rules and procedures of WHS at work place.<br>Comply with duty of care requirements<br>Use personal protective equipment according to safe work practices<br>Contribute to WHS consultative activities<br>Raise WHS issues with relevant personnel |                   |          |                    |                |
| <b>LU 2:</b> Participate in hazard assessment activities a work place | <b>The trainee will be able to:</b><br>Identify hazards or WHS issues in the workplace to relevant personnel                                                                                                                                                                                                 |                   |          |                    |                |

|                                                        |                                                                                                                                                                                                                                           |  |  |  |  |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|                                                        | <p>Assess and control risks according to own level of responsibility, in line with workplace procedures</p> <p>Report hazards or WHS issues in the workplace to relevant personnel</p> <p>Document risk control actions as required</p>   |  |  |  |  |
| <b>LU 3 :</b> Follow emergency procedures at workplace | <p><b>The trainee will be able to:</b></p> <p>Report emergencies or incidents promptly to relevant personnel</p> <p>Deal with emergencies in line with own level of responsibility</p> <p>Implement evacuation procedures as required</p> |  |  |  |  |
| <b>LU 4:</b> Participate in OHS consultative processes | <p><b>The trainee will be able to:</b></p> <p>Contribute to workplace meetings, inspections or other consultative activities</p>                                                                                                          |  |  |  |  |

|  |                                                                                                                                                                                                                                     |  |  |  |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  | <p>Raise OHS<br/>(Occupational Health<br/>and Safety) issues with<br/>designated persons in<br/>accordance with<br/>organizational<br/>procedures</p> <p>Take actions to eliminate<br/>workplace hazards or to<br/>reduce risks</p> |  |  |  |  |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

## Module 2: Identify and Implement Workplace Policy and Procedures

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to identify and implement workplace policy and procedures.

**Duration:** 20 Hrs      **Theory:** Hrs      **Practical:** Hrs

| Learning Unit                                       | Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                              | Learning Elements | Duration | Materials Required | Learning Place |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------------------|----------------|
| <b>LU 1:</b> Identify workplace policy & procedures | <b>The trainee will be able to:</b><br><br>Identify the workplace policy & procedures<br>Apply appropriate strategies that can be used to measure whether your workplace health and safety obligations are being met.<br><br>Assure the policies are realistic, resources and personnel to implement<br>Implement the policy & procedures that reflects the organizations commitments<br><br>Ensure the appropriate methods of implementation, |                   |          |                    |                |

|                                                        |                                                                                                                                                                                                                                                                   |  |  |  |  |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|                                                        | outcomes and performance indicators                                                                                                                                                                                                                               |  |  |  |  |
| <b>LU 2:</b> Implement workplace policy & procedures   | <p><b>The trainee will be able to:</b></p> <p>Apply and assign responsibility for recording systems to track continuous improvements in policy &amp; procedures</p> <p>Implement strategies for continuous improvement in effective and efficient information</p> |  |  |  |  |
| <b>LU 3:</b> Communicate workplace policy & procedures | <p><b>The trainee will be able to:</b></p> <p>Communicate procedures to help implement workplace policy</p> <p>Inform those involved in implementing the policy about expected outcomes, activities to be undertaken and assigned responsibilities</p>            |  |  |  |  |



|                                                                         |                                                                                                                                                                                                                                                                 |  |  |  |  |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>LU 4:</b> Review the implementation of workplace policy & procedures | <b>The trainee will be able to:</b><br><br>Identify the trends that may require remedial actions<br><br>Record the trends that may require remedial actions.<br><br>Ensure policy and procedures as required are made for continuous improvement of performance |  |  |  |  |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

### Module 3: Communicate at Workplace

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to communicate at workplace.

**Duration:** 30 Hrs      **Theory:** Hrs      **Practical:** Hrs

| Learning Unit                                        | Learning Outcomes                                                                                                                                                                                                                                        | Learning Elements | Duration | Materials Required | Learning Place |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------------------|----------------|
| <b>LU 1:</b><br>Communicate within the organization  | <b>The trainee will be able to:</b><br><br>Communicate within a department<br><br>Communicate with other departments.<br><br>Use various media to communicate effectively<br><br>Communicate orally and written                                          |                   |          |                    |                |
| <b>LU 2:</b><br>Communicate outside the organization | <b>The trainee will be able to:</b><br><br>Deal with vendors<br><br>Deal with clients/customers<br><br>Interact with other organisations<br><br>Use various media to communicate effectively<br><br>Work with people of different cultures / backgrounds |                   |          |                    |                |
| <b>LU 3:</b><br>Communicate effectively in workgroup | <b>The trainee will be able to:</b><br><br>Assess the issues to provide relevant suggestion to group members                                                                                                                                             |                   |          |                    |                |

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|                                                | <p>Resolve the issues/ problems /conflicts within the group</p> <p>Arrange group working sessions to increase the level of participation in the group processes</p> <p>Communicate messages to group members clearly to ensure interpretation is valid</p> <p>Communicate style /manner to reflect professional standards/ awareness of appropriate cultural practices</p> <p>Act upon constructive feedback</p> |  |  |  |  |
| <p><b>LU 4:</b><br/>Communicate in writing</p> | <p><b>The trainee will be able to:</b></p> <p>Identify relevant procedures for written information</p> <p>Use strategies to ensure correct communication in writing .i.e.</p> <ul style="list-style-type: none"> <li>• correct composition</li> <li>• clarity</li> <li>• comprehensiveness</li> <li>• accuracy</li> <li>• appropriateness</li> </ul> <p>Draft assigned written information for approval,</p>     |  |  |  |  |

|  |                                                                                                                                                                                                                             |  |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  | <p>ensuring it is written within designated timeframes</p> <p>Ensure written information meets required standards of style, format and detail</p> <p>Seek assistance / feedback to aid communication skills development</p> |  |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

## Module 4: Perform Computer Application Skills

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to perform computer application skills

**Duration:** 40 Hrs      **Theory:** Hrs      **Practical:** Hrs

| Learning Unit                                                      | Learning Outcomes                                                                                                                                                                                                                                                                   | Learning Elements | Duration | Materials Required | Learning Place |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------------------|----------------|
| <b>LU 1:</b> Prepare In-page documents as per required information | <b>The trainee will be able to:</b><br>Set keyboard preferences according to information requirements<br>Layout Page according to information requirements<br>Toggle between Languages<br>Identify the usage of tool bar<br>Insert Columns as per requirement<br>Print the document |                   |          |                    |                |
| <b>LU 2:</b> Prepare Spreadsheets as per required information      | <b>The trainee will be able to:</b>                                                                                                                                                                                                                                                 |                   |          |                    |                |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  | <p>Create workbook according to information requirements</p> <p>Insert sheet according to information requirements</p> <p>Enter basic formulae / functions using cell referencing when required</p> <p>Correct formulas when error messages occur</p> <p>Use a range of common tools during spreadsheet development</p> <p>Edit columns and rows within the spreadsheet</p> <p>Filter data</p> <p>Save the spreadsheet to a folder on a storage device</p> <p>Format spreadsheet using formatting features as required</p> <p>Incorporate object and chart in spreadsheet</p> <p>Print spreadsheet</p> |  |  |  |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

|                                                              |                                                                                                                                                                                                                                                          |  |  |  |  |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>LU 3:</b> Use MS Office as per required information       | <b>The trainee will be able to:</b><br><br>Use Microsoft Word for documentation<br>Use Microsoft Excel for documentation<br>Use Microsoft PowerPoint for presentation<br>Perform OneNote<br>Perform Outlook for emails<br>Perform Publisher applications |  |  |  |  |
| <b>LU 4:</b> Perform computer graphics in basic applications | <b>The trainee will be able to:</b><br><br>Perform graphic fundamentals in basic applications<br>Draw Points and lines to make images<br>Draw Dots in space to make images<br>Draw lightening blot<br>Shapes to make images                              |  |  |  |  |

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|                                                      | Enlarge circles and rectangles to block in forms                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |
| <b>LU 5:</b> Create Email account for communications | <b>The trainee will be able to:</b><br>Make email account for communications<br>Compose text of an email message according to organizational guidelines as required<br>Create an automatic signature for the user<br>Attach files to email message where required<br>Send email message<br>Reply to / forward a received message using available features<br>Save an attachment to the relevant folder<br>Save email message using available settings |  |  |  |  |



|  |                                                                                                                                                                                    |  |  |  |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  | <p>Adjust email accounts to restrict and quarantine possible email security problems</p> <ul style="list-style-type: none"><li>• Print email message as per requirements</li></ul> |  |  |  |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

## Module 5: Manage Personal Finances

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to manage personal finances.

**Duration:** 30 Hrs      **Theory:** Hrs      **Practical:** Hrs

| Learning Unit                          | Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                            | Learning Elements | Duration | Materials Required | Learning Place |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|--------------------|----------------|
| <b>LU 1:</b> Develop a personal budget | <b>The trainee will be able to:</b><br><br>Calculate current living expenses using available information to prepare a personal budget.<br><br>Keep a record of all income and expenses for a short period of time to help estimate ongoing expenses.<br><br>Subtract total expenses from total income to determine a surplus or deficit budget for the specified period.<br><br>Find reasons for a deficit budget and ways to reduce expenditure identified. |                   |          |                    |                |

|                                                        |                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|                                                        | Identify ways to increase income                                                                                                                                                                                                                                                                                               |  |  |  |  |
| <b>LU 2:</b> Develop long term personal budget         | <p><b>The trainee will be able to:</b></p> <p>Analyze income and expenditure and set long term personal financial goals.</p> <p>Develop a long-term budget based on the outcomes of short-term budgeting.</p> <p>Identify obstacles that might affect the business</p> <p>Formulate a regular savings plan based on budget</p> |  |  |  |  |
| <b>LU 3:</b> Identify ways to maximize future finances | <p><b>The trainee will be able to:</b></p> <p>Determine sources to maximize personal income,</p> <p>Get further education or training to maintain or improve future income.</p>                                                                                                                                                |  |  |  |  |

|  |                                                                                                                                                                                                                                                                                   |  |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  | <p>Identify the need for debt to finance living and other expenses,</p> <p>Determine the appropriate levels of debt and repayment.</p> <p>Consolidate existing debt, where possible, to minimize interest costs and fees.</p> <p>Seek professional money management services.</p> |  |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

## Module 6: Install Pumps

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to install pumps.

**Duration:** 150 Hrs      **Theory:** 35 Hrs      **Practical:** 115 Hrs

| Learning Unit                        | Learning Outcomes                                                                                                                                                                                                                                                                                                                          | Learning Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Duration                                                                                           | Materials Required                                                                                                                                                                                                                                                                                                                                 | Learning Place                                                                                                                                                          |
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| <b>LU 1:</b> Install mono-block pump | <p><b>The trainee will be able to:</b></p> <p>Arrange material/accessories required for installation of pump</p> <p>Fix the pump and install Suction and Discharge Lines</p> <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements for installation of mono-block pump</p> | <p>Describe pumps and their purpose</p> <p>Understand and differentiate between different types of pumps and their usage</p> <p>Parts of pumps and their function (for example Spiral casing, pump casing, pump shaft, impeller)</p> <p>Alignment of pump motor with foundation (procedure to prepare foundation)</p> <p>Alignment of Flanges in suction and discharge lines (position of delivery flange)</p> <p>Knowledge of types of gasket</p> <p>Electric connection required to run the pump</p> <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump.</p> | <p><b>Total</b><br/>30 Hrs</p> <p><b>Theory:</b><br/>5 Hrs</p> <p><b>Practical:</b><br/>25 Hrs</p> | <p>Gloves</p> <p>Goggles</p> <p>Helmet</p> <p>Safety Shoes</p> <p>Measuring Tape</p> <p>Pipe Wrench</p> <p>Pipe Vice</p> <p>Disc Grinder</p> <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

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|                                       |                                                                                                                                                                       | Importance of health and safety                                                                                                                                                                                                                                                  |                                                                                          | Cutting Disc 4"<br>Wire Brush (Steel Wire)<br>Combination Spanner Set<br>Pipes<br>Pipe fittings<br>Wires<br>Test Lamp<br>Nuts & bolts<br>Washer<br>Teflon tape<br>Thread<br>RPM Meter<br>Multi Meter<br>Mono-block Pump |                                                                                                                                                          |
| <b>LU 2:</b> Install centrifugal pump | <b>The trainee will be able to:</b><br><br>Arrange material/accessories required for installation of pump<br><br>Fix the pump and install Suction and Discharge Lines | Understanding and identification of centrifugal pump, its usage and function<br><br>Parts of pumps and their function (for example suction nozzle, discharge nozzle, impeller, shaft, bearings)<br><br>Alignment of pump motor with foundation (procedure to prepare foundation) | <b>Total</b><br>20 Hrs<br><br><b>Theory:</b><br>5 Hrs<br><br><b>Practical:</b><br>15 Hrs | Gloves<br>Goggles<br>Helmet<br>Safety Shoes<br>Measuring Tape<br>Pipe Wrench                                                                                                                                            | Class or demonstration room<br><br><b>EITHER</b><br>Workshop/Lab<br><br><b>OR</b><br>Professional field work in domestic building and industrial complex |

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|  | <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Alignment of Flanges in suction and discharge lines</p> <p>Electric connection required to run the pump</p> <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump</p> <p>Importance of health and safety</p> |  | <p>Pipe Vice</p> <p>Disc Grinder</p> <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> <p>Cutting Disc 4"</p> <p>Wire Brush (Steel Wire)</p> <p>Combination Spanner Set</p> <p>Pipes</p> <p>Pipe fittings</p> <p>Wires</p> <p>Test Lamp</p> <p>Nuts &amp; bolts</p> <p>Washer</p> <p>Teflon tape</p> |  |
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|                                         |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                    | Thread<br>RPM Meter<br>Multi Meter<br>Centrifugal Pump                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                         |
| <b>LU 3:</b> Install reciprocating pump | <p><b>The trainee will be able to:</b></p> <p>Arrange material/accessories required for installation of pump</p> <p>Fix the pump and install Suction and Discharge Lines</p> <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Understanding and identification of reciprocating pump, its usage and function</p> <p>Parts of pumps and their function (for example suction valve, suction pipe, delivery valve, delivery pipe, cylinder)</p> <p>Alignment of pump motor with foundation (procedure to prepare foundation)</p> <p>Alignment of Flanges in suction and discharge lines</p> <p>Electric connection required to run the pump</p> <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump.</p> <p>Importance of health and safety</p> | <p><b>Total</b><br/>20 Hrs</p> <p><b>Theory:</b><br/>5 Hrs</p> <p><b>Practical:</b><br/>15 Hrs</p> | <p>Gloves</p> <p>Goggles</p> <p>Helmet</p> <p>Safety Shoes</p> <p>Measuring Tape</p> <p>Pipe Wrench</p> <p>Pipe Vice</p> <p>Disc Grinder</p> <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> <p>Cutting Disc 4"</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |



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|                                  |                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                   |                                                                                          | Wire Brush (Steel Wire)<br>Combination Spanner Set<br>Pipes<br>Pipe fittings<br>Wires<br>Test Lamp<br>Nuts & bolts<br>Washer<br>Teflon tape<br>Thread<br>RPM Meter<br>Multi Meter<br>Reciprocating pump |                                                                                                                                                          |
| <b>LU 4:</b> Install jockey pump | <b>The trainee will be able to:</b><br><br>Arrange material/accessories required for installation of pump<br><br>Fix the pump and install Suction and Discharge Lines | Understanding and identification of jockey pump, its usage and function<br>Parts of pumps and their function<br>Importance of maintain pressure<br>Alignment of pump motor with foundation<br>Alignment of Flanges in suction and discharge lines<br>Electric connection required to run the pump | <b>Total</b><br>20 Hrs<br><br><b>Theory:</b><br>5 Hrs<br><br><b>Practical:</b><br>15 Hrs | Gloves<br>Goggles<br>Helmet<br>Safety Shoes<br>Measuring Tape<br>Pipe Wrench<br>Pipe Vice<br>Disc Grinder                                                                                               | Class or demonstration room<br><br><b>EITHER</b><br>Workshop/Lab<br><br><b>OR</b><br>Professional field work in domestic building and industrial complex |

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|  | <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation process.</p> <p>Importance of health and safety</p> | <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Different Tag and Lock</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> <p>Cutting Disc 4"</p> <p>Wire Brush (Steel Wire)</p> <p>Combination Spanner Set</p> <p>Pipes</p> <p>Pipe fittings</p> <p>Wires</p> <p>Test Lamp</p> <p>Nuts &amp; bolts</p> <p>Washer</p> <p>Teflon tape</p> |  |
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|                                       |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    | Thread<br>RPM Meter<br>Multi Meter<br>Jockey Pump                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                         |
| <b>LU 5:</b> Install submersible pump | <p><b>The trainee will be able to:</b></p> <p>Arrange material/accessories required for installation of pump</p> <p>Fix the pump and install Suction and Discharge Lines</p> <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Understanding and identification of submersible pump, its usage and function</p> <p>Types of submersible pump according to capacity</p> <p>Advantages of submersible pump (for example; efficient and relatively maintenance free, no cavitation problem)</p> <p>Parts of pumps and their function</p> <p>Alignment of pump motor with foundation</p> <p>Alignment of Flanges in suction and discharge lines</p> <p>Electric connection required to run the pump</p> <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump.</p> <p>Importance of health and safety</p> | <p><b>Total</b><br/>20 Hrs</p> <p><b>Theory:</b><br/>5 Hrs</p> <p><b>Practical:</b><br/>15 Hrs</p> | <p>Gloves</p> <p>Goggles</p> <p>Helmet</p> <p>Safety Shoes</p> <p>Measuring Tape</p> <p>Pipe Wrench</p> <p>Pipe Vice</p> <p>Disc Grinder</p> <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> <p>Cutting Disc 4"</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

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|                                     |                                                                                                                                                                       |                                                                                                                                                                                                                                                                                             |                                                                                  | Wire Brush (Steel Wire)<br>Combination Spanner Set<br>Pipes<br>Pipe fittings<br>Wires<br>Test Lamp<br>Nuts & bolts<br>Washer<br>Teflon tape<br>Thread<br>RPM Meter<br>Multi Meter<br>Submersible Pump |                                                                                                                                                  |
| <b>LU 6:</b> Install deep well pump | <b>The trainee will be able to:</b><br><br>Arrange material/accessories required for installation of pump<br><br>Fix the pump and install Suction and Discharge Lines | Understanding and identification of deep well pump, its usage and function<br>Parts of pumps and their function<br>Installation procedure<br>Alignment of pump motor with foundation<br>Alignment of Flanges in suction and discharge lines<br>Electric connection required to run the pump | <b>Total</b><br>20 Hrs<br><b>Theory:</b><br>5 Hrs<br><b>Practical:</b><br>15 Hrs | Gloves<br>Goggles<br>Helmet<br>Safety Shoes<br>Measuring Tape<br>Pipe Wrench<br>Pipe Vice<br>Disc Grinder                                                                                             | Class or demonstration room<br><b>EITHER</b><br>Workshop/Lab<br><b>OR</b><br>Professional field work in domestic building and industrial complex |

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|  | <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump.</p> <p>Importance of health and safety</p> | <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Different Tag and Lock</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> <p>Grinding Disc 4"</p> <p>Cutting Disc 4"</p> <p>Wire Brush (Steel Wire)</p> <p>Combination Spanner Set</p> <p>Pipes</p> <p>Pipe fittings</p> <p>Wires</p> <p>Test Lamp</p> <p>Nuts &amp; bolts</p> <p>Washer</p> <p>Teflon tape</p> |  |
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| <b>LU 7:</b> Install different kinds of booster pumps | <p><b>The trainee will be able to:</b></p> <p>Arrange material/accessories required for installation of pump</p> <p>Fix the pump and install Suction and Discharge Lines</p> <p>Connect Electricity and run the pump to check the operation.</p> <p>Follow relevant health and safety requirements during installation of pump</p> | <p>Understanding and identification of booster pumps, its usage and function</p> <p>Parts of pumps and their function</p> <p>Installation procedure</p> <p>Alignment of pump motor with foundation</p> <p>Alignment of Flanges in suction and discharge lines</p> <p>Electric connection required to run the pump</p> <p>Knowledge of electric standards and relevant safety (for example electrical systems, protective devices, switchboard cabinets, connection technologies and pump terminals)</p> <p>Check the operation of the pump.</p> <p>The importance of PPEs when carrying out installation of pump.</p> <p>Importance of health and safety</p> | <p><b>Total</b><br/>20 Hrs</p> <p><b>Theory:</b><br/>5 Hrs</p> <p><b>Practical:</b><br/>15 Hrs</p> | <p>Gloves</p> <p>Goggles</p> <p>Helmet</p> <p>Safety Shoes</p> <p>Measuring Tape</p> <p>Pipe Wrench</p> <p>Pipe Vice</p> <p>Disc Grinder</p> <p>Philips/Flat Screw Driver Set</p> <p>Hammer Drill Machine</p> <p>Magnet Sprit Level</p> <p>Different Tag and Lock</p> <p>Cotton Rags</p> <p>Hack Saw Blade</p> <p>Emery Paper</p> <p>Baby Grinder 4"</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

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|  |  |  |  | Grinding Disc 4"<br>Cutting Disc 4"<br>Wire Brush (Steel Wire)<br>Combination Spanner Set<br>Pipes<br>Pipe fittings<br>Wires<br>Test Lamp<br>Nuts & bolts<br>Washer<br>Teflon tape<br>Thread<br>RPM Meter<br>Multi Meter<br>Booster Pumps |  |
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## Module 7: Install Pipe Fixtures

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to install pipe fixtures

**Duration:** 120 Hrs      **Theory:** 25 Hrs      **Practical:** 95 Hrs

| Learning Unit                             | Learning Outcomes                                                                                                                                                                                                 | Learning Elements                                                                                                                                                                                                                                                                                                                                                     | Duration                                                                                  | Materials Required                                                                                                                                                                                                                                                                                                   | Learning Place                                                                                                                                           |
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| <b>LU 1:</b> Install pneumatic components | <b>The trainee will be able to:</b><br>Install pressure gauge<br>Install the pneumatic components<br>Ensure isolation of the system<br>Follow relevant health and safety requirements during installation of pump | Describe Pneumatic system<br><br>Types of pneumatic components and their functions (for example; sensors, solenoid valve, pressure gauge, actuator valve, air compressor)<br><br>Define procedure of installation of pneumatic components<br><br>The importance of PPEs when carrying out installation of pneumatic components<br><br>Importance of health and safety | <b>Total</b><br>13 Hrs<br><br><b>Theory:</b><br>03 Hrs<br><br><b>Practical:</b><br>10 Hrs | Measuring Tape<br>Combination Pliers<br>Cold Chisel<br>Straight Peen Hammer 2 lbs.<br>Hand Hack Saw<br>Adjustable Wrench 8" to 12"<br>Phillips/ Flat Screw Driver Set<br>Open End Spanner Set<br>Teflon tape<br>Thread<br>Thread sealant<br>Hammer Drill Machine (Hilti)<br>Hand Drill Machine<br>Magnet Sprit Level | Class or demonstration room<br><br><b>EITHER</b><br>Workshop/Lab<br><br><b>OR</b><br>Professional field work in domestic building and industrial complex |



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|                                    |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                           | Plumb bob with Mason Line<br><br>Disc 14" Power Cutter<br><br>Chiseler (Jack Hammer Machine)<br><br>Baby Grinder 4"<br><br>Laser Level<br><br>Pneumatic components                                                                                                               |                                                                                                                                                                  |
| <b>LU 2:</b> Install sanitary ware | <b>The trainee will be able to:</b><br><br>Cut and join the pipe accordingly<br><br>Fix accessories<br><br>Mark fastener's position<br><br>Install different types of plumbing fixture as per manufacturer's recommendation<br><br>Connect water supply/drainage system<br><br>Follow relevant health and safety requirements for installation of fixtures | Definition of sanitary ware<br><br>Importance and function of different sanitary wares<br><br>Define different types of sanitary fixtures & fittings<br><b>Sanitary Fixtures:</b> sink, shower, bath, basin, water closet (WC), urinal, concealed flush tank<br><b>Fittings:</b> e.g. traps, elbows, bends, tee, branch, pan/WC connection, sockets, mixers<br><br>Procedures of installation of different sanitary wares<br><br>The importance of PPEs when carrying out installation work.<br><br>Importance of health and safety | <b>Total</b><br>60 Hrs<br><br><b>Theory:</b><br>10 Hrs<br><br><b>Practical:</b><br>50 Hrs | Measuring Tape<br><br>Combination Pliers<br><br>Cold Chisel<br><br>Straight Peen Hammer 2 lbs.<br><br>Hand Hack Saw<br><br>Adjustable Wrench 8" to 12"<br><br>Phillips/ Flat Screw Driver Set<br><br>Open End Spanner Set<br><br>Teflon tape<br><br>Thread<br><br>Thread sealant | Class or demonstration room<br><br><b>EITHER</b><br><br>Workshop/Lab<br><br><b>OR</b><br><br>Professional field work in domestic building and industrial complex |

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|                                           |                                                                                                   |                                                                                                                                            |                                                    | Hammer Drill Machine (Hilti)<br>Hand Drill Machine<br>Magnet Sprit Level<br>Plumb bob with Mason Line<br>Disc 14" Power Cutter<br>Chiseler (Jack Hammer Machine)<br>Baby Grinder 4"<br>Laser Level<br>Wash basin<br>Water closet<br>Urinal<br>Water mixer<br>Pillar cork<br>Water tank<br>Shower Mixer |                                                              |
| <b>LU 3:</b> Install hot water appliances | <b>The trainee will be able to:</b><br>Install the appliance as per manufacturer's recommendation | Define hot water appliances and their types (Geysers, boiler, electric heater)<br>Define procedure of installation of hot water appliances | <b>Total</b><br>20 Hrs<br><b>Theory:</b><br>05 Hrs | Geyser<br>Boiler                                                                                                                                                                                                                                                                                       | Class or demonstration room<br><b>EITHER</b><br>Workshop/Lab |

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|                                            | <p>Connect piping system with hot water appliance</p> <p>Follow relevant health and safety requirements for installation of hot water appliances</p>                                                                                                                        | <p>The importance of PPEs when carrying out installation work.</p> <p>Importance of health and safety</p>                                                                                                                                                              | <p><b>Practical:</b></p> <p>15 Hrs</p>                                                                      | <p>Electric heater</p> <p>Teflon tape</p> <p>Thread</p> <p>Thread sealant</p> <p>NRV/check valve</p> <p>Safety valve</p> <p>Gate valve</p> <p>Thermostat</p> <p>Strainer</p> <p>Union</p> <p>Temperature and pressure gauge</p> | <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p>                                                                             |
| <p><b>LU 4:</b> Install gas appliances</p> | <p><b>The trainee will be able to:</b></p> <p>Install the appliance as per manufacturer's recommendation</p> <p>Connect piping system with appliance</p> <p>Connect gas supply</p> <p>Follow relevant health and safety requirements for installation of gas appliances</p> | <p>Define gas appliances and their types (Geyser, Heater, heat exchanger, Stove, Oven, Burner)</p> <p>Define procedure of installation of gas appliances</p> <p>The importance of PPEs when carrying out installation work.</p> <p>Importance of health and safety</p> | <p><b>Total</b></p> <p>13 Hrs</p> <p><b>Theory:</b></p> <p>3 Hrs</p> <p><b>Practical:</b></p> <p>10 Hrs</p> | <p>Copper pipe</p> <p>Flaring tool</p> <p>Swaging tool</p> <p>Brazing set</p> <p>Teflon tape</p> <p>Sealant Paste</p> <p>NRV</p> <p>Flow regulator</p> <p>Ball valve</p>                                                        | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

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|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                     |                                                                                                               | Geyser, Heater,<br>heat exchanger,<br>Stove ,Oven,<br>Burner<br><br>Dryer                                                   |                                                                                                                                                                  |
| <b>LU 5:</b> Install water storage tank | <b>The trainee will be able to:</b><br><br>Ensure tank foundation as per requirement<br><br>Install the tank<br><br>Connect piping system with water tank<br><br>Follow relevant health and safety requirements for installation | Describe water storage tank<br><br>Describe the purpose of water storage tank<br><br>Define procedure of installation of water tank<br><br>Preparation of foundation/base<br><br>The importance of PPEs when carrying out installation work.<br><br>Importance of health and safety | <b>Total</b><br><b>14 Hrs</b><br><br><b>Theory:</b><br><b>4 Hrs</b><br><br><b>Practical:</b><br><b>10 Hrs</b> | Gate valve<br><br>Teflon tape<br><br>Thread<br><br>Thread sealant<br><br>Union<br><br>Float valve<br><br>Water storage tank | Class or demonstration room<br><br><b>EITHER</b><br><br>Workshop/Lab<br><br><b>OR</b><br><br>Professional field work in domestic building and industrial complex |

## Module 8: Test Piping System

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to test piping system

**Duration:** 100 Hrs      **Theory:** 24 Hrs      **Practical:** 76 Hrs

| Learning Unit                                | Learning Outcomes                                                                                                                                                                                                                            | Learning Elements                                                                                                                                                                                                                                                                                                                             | Duration                                                                                           | Materials Required                                                                                                                        | Learning Place                                                                                                                                                          |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LU 1:</b> Perform liquid penetration test | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p> <p>Perform liquid penetration test according to standard as per given task</p> <p>Follow health and safety requirement</p> | <p>Knowledge of liquid penetration testing standards</p> <p>Knowledge of applying cleaner and developer as per standard procedure</p> <p>Practice liquid penetration test according to standard</p> <p>Procedure to inspect pipes for cracks</p> <p>The importance of PPEs when carrying out test.</p> <p>Importance of health and safety</p> | <p><b>Total</b><br/>25 Hrs</p> <p><b>Theory:</b><br/>7 Hrs</p> <p><b>Practical:</b><br/>18 Hrs</p> | <p>Pipe Wrench</p> <p>liquid penetration test kit with cleaner and developer</p> <p>Cotton Rag</p> <p>Welded Pipe</p>                     | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |
| <b>LU 2:</b> Perform hydrostatic test        | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p> <p>Perform hydrostatic test according to standard as per given task</p>                                                    | <p>Knowledge of hydrostatic testing standards</p> <p>Knowledge and practice of connecting hydrostatic test assembly with pipe circuit</p> <p>knowledge and practice of applying and holding pressure as per standard procedure</p> <p>Explain filling up water in pipe circuit according to standard practice</p>                             | <p><b>Total</b><br/>25 Hrs</p> <p><b>Theory:</b><br/>5 Hrs</p> <p><b>Practical:</b><br/>20 Hrs</p> | <p>Pipe Wrench</p> <p>Hydrostatic Testing Pump</p> <p>Compressor</p> <p>Pressure Gauges 300 psi</p> <p>Teflon tape</p> <p>Pipe wrench</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

|                                     |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                             |                                                                                                                                   |                                                                                                                                                                         |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | Follow health and safety requirement                                                                                                                                                                                                | <p>Procedure of air purging</p> <p>Procedure to inspect pipe circuit for leakages</p> <p>The importance of PPEs when carrying out testing.</p> <p>Importance of health and safety</p>                                                                                                                                                                                        |                                                                                                             | <p>Adjustable wrench</p> <p>Ball valve</p> <p>Pipe</p> <p>Pipe fittings</p>                                                       |                                                                                                                                                                         |
| <b>LU 3:</b> Perform pneumatic test | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p> <p>Perform pneumatic test according to standard as per given task</p> <p>Follow health and safety requirement</p> | <p>Knowledge of pneumatic testing standards</p> <p>Procedure of Installation of pneumatic testing with pipe system</p> <p>Knowledge of connect compressor with testing kit and applying pressure as per standards</p> <p>Procedure to inspect piping system for leakages</p> <p>The importance of PPEs when carrying out testing.</p> <p>Importance of health and safety</p> | <p><b>Total</b></p> <p>25 Hrs</p> <p><b>Theory:</b></p> <p>7 Hrs</p> <p><b>Practical:</b></p> <p>18 Hrs</p> | <p>Pipe Wrench</p> <p>Pneumatic Testing Kit</p> <p>Compressor</p> <p>Pressure Gauges 300 psi</p> <p>Hydrostatic test material</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |
| <b>LU 4:</b> Perform gravity test   | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p>                                                                                                                   | <p>Knowledge of gravity testing standards</p> <p>Importance of properly plugging all lower points</p> <p>Fixing of stack as per standard procedure</p> <p>Procedure of filling pipe with water</p>                                                                                                                                                                           | <p><b>Total</b></p> <p>25 Hrs</p> <p><b>Theory:</b></p> <p>5 Hrs</p> <p><b>Practical:</b></p>               | <p>Pipe Wrench</p> <p>Different sizes of Plugs</p>                                                                                | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p>                                                                            |

|  |                                                                                                                 |                                                                                                                                                     |        |  |                                                                     |
|--|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|---------------------------------------------------------------------|
|  | <p>Perform gravity test according to standard as per given task</p> <p>Follow health and safety requirement</p> | <p>Perform inspection on pipe work for leakages</p> <p>The importance of PPEs when carrying out testing.</p> <p>Importance of health and safety</p> | 20 Hrs |  | Professional field work in domestic building and industrial complex |
|--|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|---------------------------------------------------------------------|

## Module 9: Maintain Pipelines

**Objective of the module:** The aim of this module is to develop advanced knowledge, skills and understanding to maintain pipelines

**Duration:** 100 Hrs      **Theory:** 20 Hrs      **Practical:** 80 Hrs

| Learning Unit                                            | Learning Outcomes                                                                                                                                                                                                                                                                                                                 | Learning Elements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Duration                                                                                           | Materials Required                                                                                       | Learning Place                                                                                                                                                          |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LU 1:</b> Perform periodic and preventive maintenance | <p><b>The trainee will be able to:</b></p> <p>Perform daily inspection/ maintenance and fill up daily inspection log sheets according to given task</p> <p>Perform monthly inspection/ maintenance and fill up monthly inspection log sheet as per manufacturer's recommendations</p> <p>Follow health and safety requirement</p> | <p>Procedure of preparing maintenance schedule according to SOP</p> <p>Knowledge and practice of fill up/ check log sheet according to SOP</p> <p>Importance and practice of lockout/ tag out substance supply</p> <p>Knowledge and practice of reporting procedure for lockout/ tag out substance supply</p> <p>Importance/advantages of scheduled maintenance (daily, weekly and monthly) according to manufacturer's recommendations in manuals</p> <p>Procedure and practice of preparing feedback/ reports</p> <p>Importance of health and safety</p> | <p><b>Total</b><br/>40 Hrs</p> <p><b>Theory:</b><br/>8 Hrs</p> <p><b>Practical:</b><br/>32 Hrs</p> | <p>Different Tags and Locks</p> <p>Process SOPs</p> <p>Equipment Maintenance Manuals</p> <p>Log Book</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |
| <b>LU 2:</b> Perform breakdown maintenance               | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p>                                                                                                                                                                                                                 | <p>Procedure of prepare plan for breakdown maintenance</p> <p>Knowledge of alternate system at the time of breakdown according to manual</p>                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>Total</b><br/>35 Hrs</p> <p><b>Theory:</b><br/>7 Hrs</p>                                     | <p>Different Tags and Locks</p> <p>Process SOPs</p>                                                      | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p>                                                                                             |



|                                            |                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                          |                                                                                                             |                                                                                                         |                                                                                                                                                                         |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <p>Perform breakdown maintenance as and when required and fill up log sheet as per manufacturer's recommendations</p> <p>Follow health and safety requirement</p>                                                               | <p>Importance of studying log sheet before carryout breakdown maintenance</p> <p>Importance and practice of lockout/ tag out substance supply</p> <p>Knowledge and practice of reporting procedure for lockout/ tag out substance supply</p> <p>Importance of health and safety</p>                                      | <p><b>Practical:</b></p> <p>28 Hrs</p>                                                                      | <p>Equipment Maintenance Manuals</p> <p>Log Book</p>                                                    | <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p>                                                                             |
| <p><b>LU 3:</b> Install tracing system</p> | <p><b>The trainee will be able to:</b></p> <p>Select appropriate tools/ equipment according to the given task</p> <p>Install tracing and verify stenciling according to manuals</p> <p>Follow health and safety requirement</p> | <p>Knowledge and practice of finding references from manuals for tracing system</p> <p>Knowledge and practice of verifying tags on all equipment as per approved drawing</p> <p>Knowledge and practice of verifying stenciling on all types of piping as per approved drawing</p> <p>Importance of health and safety</p> | <p><b>Total</b></p> <p>25 Hrs</p> <p><b>Theory:</b></p> <p>5 Hrs</p> <p><b>Practical:</b></p> <p>20 Hrs</p> | <p>Equipment Maintenance Manuals</p> <p>Equipment drawings</p> <p>Piping system layout and drawings</p> | <p>Class or demonstration room</p> <p><b>EITHER</b></p> <p>Workshop/Lab</p> <p><b>OR</b></p> <p>Professional field work in domestic building and industrial complex</p> |

## General assessment guidance for *Pipe Fitter Lev-3*

Good practice in Pakistan makes, use of sessional and final assessments, the basis of which is described below. Good practice by vocational training providers in Pakistan, is to use a combination of these sessional and final assessments, combined to produce the final qualification result.

**Sessional assessment** is going on all the time. Its purpose is to provide feedback on what students are learning:

- to the student: to identify achievement and areas for further work
- To the teacher: to evaluate the effectiveness of teaching to date, and to focus future plans.

Assessors need to devise sessional assessments for both theoretical and practical work. Guidance is provided in the assessment strategy

**Final assessment** is the assessment, usually on completion of a course or module, which says whether or not the student has "passed". It is – or should be – undertaken with reference to all the objectives or outcomes of the course, and is usually fairly formal. Considerations of security – ensuring that the student who gets the credit is the person who did the work – assume considerable importance in final assessment.

### Methods of assessment

For lessons with a high quantity of theory, written or oral tests related to learning outcomes and/ or learning content can be conducted. For workplace lessons, assessment can focus on the quality of planning the related process, the quality of executing the process, the quality of the product and/or evaluation of the process.

Methods include direct assessment, which is the most desirable form of assessment. For this method, evidence is obtained by direct observation of the student's performance.

Examples for direct assessment of a Pipe Fitter Lev-3 include:

- Work performances, for example installing Pipe Fixture
- Demonstrations, for example demonstrating to Install Pumps
- Direct questioning, where the assessor would ask the student about his consideration during testing/commissioning of piping system
- Paper-based tests, such as multiple choice or short answer questions on installation of pumps, installation of fixtures, maintenance of pipelines

Indirect assessment is the method used where the performance could not be watched and evidence is gained indirectly.

Examples for indirect assessment of a Pipe fitter Lev-3 include:

- Work products, such as any completed fixture installation
- Workplace documents, such as note book or practical activity journal

Indirect assessment should only be a second choice. (In some cases, it may not even be guaranteed that the work products were produced by the person being assessed.)

## **Principles of assessment**

All assessments should be valid, reliable, fair and flexible:

Fairness means that there should be no advantages or disadvantages for any assessed person. For example, it should not happen that one student gets prior information about the type of work performance that will be assessed, while another candidate does not get any prior information.

Validity means that a valid assessment assesses what it claims to assess.

Reliability means that the assessment is consistent and reproducible.

Flexibility means that the assessor has to be flexible concerning the assessment approach. For example, if there is a mishap during the assessment, the assessor should modify the arrangements to accommodate the students' needs.

## **Assessment strategy for Pipe Fitter Lev-3 Curriculum**

This curriculum consists of 9 modules:

- Module 1: Apply Work Health and Safety Practices (WHS)
- Module 2: Identify and Implement Workplace Policy and Procedures
- Module 3: Communicate at Workplace
- Module 4: Perform Computer Application Skills
- Module 5: Manage Personal Finances
- Module 6: Install Pumps
- Module 7: Install Pipe Fixtures
- Module 8: Test Piping System
- Module 9: Maintain Pipelines

### **Sessional assessment**

The sessional assessment shall be conducted after completion of each module in two parts: theoretical assessment and practical assessment. The sessional marks shall contribute to the final qualification.

Theoretical assessment for all learning modules must consist of a written paper lasting at least 30 minute per module. This can be a combination of multiple choice and short answer questions.

For practical assessment, all procedures and methods for the modules must be assessed on a sessional basis. Guidance is provided below under Planning for assessment.

### **Final assessment**

Final assessment shall also be in two parts: theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification.

For the final practical assessment, each student shall be assessed over a period of 4-hour session. During this period, each student must be assessed on his ability to perform a complete job for each of the last 3 modules.

Module 9: Maintain Pipeline shall not be assessed at the time of final assessment. Practical work for this module shall be assessed on a sessional basis only.

### **The assessment team**

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five students per assessor. In this example, a group of 20 students shall therefore require assessments to be carried out over a four-day period. For a group of only 10 students, assessments would be carried out over a two-day period only.

## **Planning for assessment**

Sessional assessment: assessors need to plan in advance how they will conduct sessional assessments for each module. The tables on the following pages are for assessors to use to insert how many hours of theoretical and practical assessment will be conducted and what the scheduled dates are.

Final assessment: Training providers need to decide ways to combine modules into a cohesive two-day final assessment program for each group of five students. Training providers must agree the dishes for practical assessments in advance.

## Complete list of tools and equipment

| S. No | Description                               | Quantity |
|-------|-------------------------------------------|----------|
| 1     | Leather Gloves                            | 20 pairs |
| 2     | Cotton Gloves                             | 20 pairs |
| 3     | Goggles                                   | 20 nos.  |
| 4     | Safety mask                               | 100 pcs  |
| 5     | Helmet                                    | 25 nos.  |
| 6     | Safety belt                               | 10 nos.  |
| 7     | Safety Shoes                              | 25 pairs |
| 8     | Ear plug / Ear Muff                       | 25 pcs   |
| 9     | Coverall                                  | 20 nos.  |
| 10    | Measuring Tape                            | 20 nos.  |
| 11    | Combination Pliers                        | 10 nos.  |
| 12    | Vernier Caliper                           | 10 nos.  |
| 13    | Inside/Outside Caliper                    | 10 nos.  |
| 14    | Pointing chisel                           | 10 nos.  |
| 15    | Cold Chisel                               | 10 nos.  |
| 16    | Ball Peen Hammer                          | 10 nos.  |
| 17    | Straight Peen Hammer 2 lbs.               | 10 nos.  |
| 18    | Club Hammer                               | 10 nos.  |
| 19    | Pipe Wrench 12" to 24"                    | 10 nos.  |
| 20    | Pipe Vise 6" with tripod                  | 4 nos.   |
| 21    | Ratchet die set ½" to 2"                  | 3 nos.   |
| 22    | Hand Hack Saw                             | 20 nos.  |
| 23    | Power Disc grinder 14"                    | 5 nos.   |
| 24    | Portable Welding Machine 3 Phase 300 Amp. | 3 nos.   |
| 25    | Face Shield and Holder with cable         | 20 nos.  |
| 26    | File Set                                  | 5 sets   |
| 27    | Pipe Reamer Set                           | 10 nos.  |

|    |                                         |         |
|----|-----------------------------------------|---------|
| 28 | Adjustable Wrench 8" to 12"             | 10 nos. |
| 29 | Phillips Screw Driver Set               | 5 set   |
| 30 | Flat Screw Driver Set                   | 5 set   |
| 31 | Allen Key Set                           | 5 set   |
| 32 | Tin Snap Cutter                         | 5 nos.  |
| 33 | Pipe Cutter ½" to 2"                    | 5 nos.  |
| 34 | Open End Spanner Set (Metric)           | 5 set   |
| 35 | Open End Spanner Set (Imperial)         | 5 set   |
| 36 | Offset Ring Spanner Set (Metric)        | 5 set   |
| 37 | Offset Ring Spanner Set (Imperial)      | 5 set   |
| 38 | Combination Spanner Set (Metric)        | 5 set   |
| 39 | Combination Spanner Set (Imperial)      | 5 set   |
| 40 | Hammer Drill Machine (Hilti)            | 3 nos.  |
| 41 | Hand Drill Machine                      | 10 nos. |
| 42 | Twist Drill Set                         | 5 set   |
| 43 | Masonry Drill Set                       | 5 set   |
| 44 | Hydraulic Pipe Bender                   | 2 nos.  |
| 45 | Heat Gun                                | 10 nos. |
| 46 | Fusion Machine (PPRC set 20 mm ~ 63 mm) | 4 nos.  |
| 47 | Gas Cutter Set with Torch, Pipe         | 3 set   |
| 48 | Acetylene Cylinder                      | 3 nos.  |
| 49 | Oxygen Cylinder                         | 3 nos.  |
| 50 | Magnate Sprit Level                     | 20 nos. |
| 51 | Water Level                             | 4 nos.  |
| 52 | Soldering Machine                       | 10 nos. |
| 53 | Flaring Tool Set                        | 5 set   |
| 54 | Swaging Tool Set                        | 5 set   |
| 55 | Tube Cutter                             | 10 nos. |
| 56 | Bench Vise 6"                           | 10 nos. |
| 57 | Tri Square 12" - 24"                    | 20 nos. |
| 58 | Plumb bob with Mason Line               | 10 nos. |

|    |                                          |          |
|----|------------------------------------------|----------|
| 59 | Different Tags and Locks                 | 100 nos. |
| 60 | Disc 14" Power Cutter                    | 10 nos.  |
| 61 | Pin Grinder                              | 4 nos.   |
| 62 | Stone for Pin Grinder                    | 2 nos.   |
| 63 | Wire Brush for Pin Grinder               | 5 nos.   |
| 64 | Testing Plugs 2" to 4" expendable        | 5 nos.   |
| 65 | RPM Meter                                | 5 nos.   |
| 66 | Multi Meter                              | 5 nos.   |
| 67 | Hydrostatic Testing Pump                 | 4 nos.   |
| 68 | Pressure Gauges 300 psi                  | 5 nos.   |
| 69 | Pneumatic Testing Kit                    | 5 nos.   |
| 70 | Laser Level                              | 10 nos.  |
| 71 | Fusion Machin (PE Pipe Set) Butt Fusion  | 4 nos.   |
| 72 | Face Shield (Transparent)                | 20 nos.  |
| 73 | Welding Gloves                           | 20 pair  |
| 74 | Mono-block Pump                          | 5 nos.   |
| 75 | Centrifugal Pump                         | 5 nos.   |
| 76 | Reciprocating Pump                       | 5 nos.   |
| 77 | Submersible Pump                         | 5 nos.   |
| 78 | Jockey Pump                              | 5 nos.   |
| 79 | Deep well Pump                           | 5 nos.   |
| 80 | Booster pumps, different types and sizes | 5 nos.   |



## List of consumable supplies

1. Drill Bit Set
2. Process SOPs
3. Equipment Maintenance Manuals
4. Log Book
5. Stone for Pin Grinder
6. Wire Brush for Pin Grinder
7. Wire Brush (Steel Wire)
8. Chalk Liner
9. Kerosene Oil
10. Cutting Oil
11. WD 40
12. Grease
13. Cotton Rags
14. Hack Saw Blade
15. Emery Paper
16. Grinding Disc 4"
17. Cutting Disc 4"
18. Grinding Disc 7"
19. Cutting Disc 7"
20. Wall Cutting Disc 7"
21. **GI Pipes (1/2" ~ 1")**
22. GI Elbow (90, 45)
23. GI Tee
24. GI Bend
25. GI Union
26. GI Cross Tee
27. GI Socket

- 28. GI Reducer
- 29. Barrel Nipple
- 30. M/F Elbow
- 31. M/F Socket
- 32. End Plug
- 33. Bridge Bend
- 34. **Copper Pipes (3/8" ~ 3/4")**
- 35. Elbow (90, 45)
- 36. Tee
- 37. Bend
- 38. Union
- 39. Cross Tee
- 40. Socket
- 41. Reducer
- 42. **MS Pipes (1" ~ 4")**
- 43. Flanges (Welded/threaded)
- 44. Tee
- 45. Elbow (90/45)
- 46. Bends
- 47. Reducer
- 48. Flanges (Welded/treaded)
- 49. **UPVC pipes (1/2" ~ 4")**
- 50. UPVC Socket
- 51. UPVC Tee
- 52. UPVC Elbow (90/45)
- 53. UPVC Bends
- 54. UPVC Reducer
- 55. UPVC Y-Branch
- 56. UPVC P Trap

- 57. UPVC Multi flow Trap
- 58. Test Plug
- 59. UPVC Union
- 60. UPVC Male Adopter
- 61. Brass Thread Tee
- 62. Brass Thread Elbow
- 63. Brass Thread Union
- 64. Brass Thread Socket
- 65. **CPVC Pipe (1/2" ~ 1")**
- 66. CPVC Elbow
- 67. CPVC Tee
- 68. CPVC Union
- 69. CPVC Brass Male Adopter
- 70. **PPRC Pipes (20 mm ~ 32 mm)**
- 71. Socket
- 72. Reducer
- 73. Treaded Elbow
- 74. Male Adopter
- 75. Female Adopter
- 76. CP Nipple
- 77. PE Pipes (20 mm ~ 32 mm)
- 78. Socket
- 79. Elbow (90, 45)
- 80. Tee
- 81. Bend
- 82. Cross Tee
- 83. Reducer
- 84. Flanges (Welded/threaded)
- 85. Globe Valves (1" ~ 3")

86. Safety Valve (1/2" ~ 1")
87. Check Valve (1" ~ 3")
88. Pressure Reducing Valve (1" ~ 3")
89. Butterfly Valve (1" ~ 3")
90. Injector Valve (1" ~ 1 1/2")
91. Foot valve (1/2" ~ 1")
92. Float Valve (1/2" ~ 1")
93. Gate Valve (1" ~ 3")
94. Ball Valve (1/2" ~ 1")
95. Non-return Valve (1/2" ~ 1")
96. Wash Basin with all fittings
97. Water Closet (WC) European style with all fittings
98. Urinal with all fittings
99. Water Closet (WC) Indian style with all fittings
100. Bidet with all fittings
101. Water storage Tank (250 Liter) with inlet, outlet and washout connections
102. Geyser (Gas, Electric)
103. Kitchen Sink with all fittings
104. CP Chain (1 m)
105. Toilet Shower
106. Floor Drain
107. Bib Tap
108. Tee Cock
109. Shower with rod
110. Valve mixer
111. Sink Mixer
112. Wash basin mixer
113. Side pillar cock
114. Bottle Trap

- 115. U Trap
- 116. S Trap
- 117. Basin Waste (Complete)
- 118. Teflon Tape
- 119. Lock tight/ Hold tight
- 120. Thread
- 121. Silicon
- 122. Epoxy
- Boiler
- Thermostat
- Strainer
- Temperature and pressure gauge
- Flow regulator
- Heater, heat exchanger, Stove ,Oven, Burner
- Sealant Paste
- Thread

## List of Stationary

1. Different Tags and Locks
2. ASTM – BS Standards
3. Process SOPs
4. Equipment Maintenance Manuals
5. Log Book
6. Handbooks
7. Design Books/ Sheets
8. Pencils
9. Erasers
10. Pencil Sharpeners
11. Paper Cutter
12. Scissors
13. Color Pencils
14. White chart paper
15. Brown Sheets
16. White Board Markers (red, blue, green, black)
17. Permanent markers (black)
18. File covers

## Credit values

The credit value of the National Certificate Level 3 in Pipe Fitter is defined by estimating the amount of time/ instruction hours required to complete each competency unit and competency standard. The NVQF uses a standard credit value of 1 credit = 10 hours of learning (Following Higher Education Commission (HEC) guidelines).

The credit values are as follows:

| Competency Standard                                       | Estimate of hours | Credit |
|-----------------------------------------------------------|-------------------|--------|
| 1: Apply Work Health and Safety Practices (WHS)           | 30                | 03     |
| 2: Identify and Implement Workplace Policy and Procedures | 20                | 02     |
| 3: Communicate at Workplace                               | 30                | 03     |
| 4: Perform Computer Application Skills                    | 40                | 04     |
| 5: Manage Personal Finances                               | 30                | 03     |
| 6. Install Pumps                                          | 150               | 15     |
| 7. Install Pipe Fixtures                                  | 120               | 12     |
| 8. Test Piping System                                     | 100               | 10     |
| 9. Maintain Pipelines                                     | 100               | 10     |

