



Republic of Rwanda  
Ministry of Education



**RTB** | RWANDA  
TVET BOARD

## BASICS OF PLUMBING

**BDCBP301**

**DEMONSTRATE BASICS OF PLUMBING**

### Competence

RQF Level: 3

Learning Hours



Credits: 5

Sector: Construction and Building Services

Trade: Building construction

Module Type: Specific

Curriculum: CBSBDC3001- TVET Certificate 3 in Building Construction

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<b>Purpose statement</b>	This core module describes the skills, knowledge and attitude to be acquired by the learner to perform basics of plumbing; prepare materials, tools and Equipment; demonstrate basics of pipe connection; demonstrate basics of sanitary appliances and rain water tank installation.				
<b>Leaning assumed to be in place</b>	Safety, Health and environment at workplace, Construction basic technical drawing, Building Set out, Fundamentals of building materials.				
<b>Delivery modality</b>	<b>Training delivery</b>	<b>100%</b>	<b>Assessment</b>	<b>Total 100%</b>	
	Theoretical content	30%	Formative assessment	30%	
	Practical work:	70%		70%	100%
	<ul style="list-style-type: none"> <li>Group project and presentation 20%</li> <li>Individual project /Work 50%</li> </ul>				
				Summative Assessment	N/A

### Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
<b>1. Prepare materials, tools and equipment.</b>	1.1. Appropriate selection of PPE according to the work to be done
	1.2. Appropriate selection of tools and equipment according to the work to be done
	1.3. Appropriate selection of materials according to the applicable quality standards
<b>2. Demonstrate basics of pipe connection</b>	2.1. Appropriate selection of pipes according to their types
	2.2. Right assembling of pipes with respect to the plumbing drawing
	2.3. Pipe joints are well done with respect to the directions
<b>3. Demonstrate basics of sanitary appliances installation</b>	3.1. Correct installation of water closet according to their type
	3.2. Correct installation of bathtub according to their type
	3.3. Correct installation of sink according to their type

<b>Learning outcomes</b>	<b>At the end of the module the learner will be able to:</b>  1. Prepare materials, tools and equipment 2. Demonstrate basics of pipe connection 3. Demonstrate basics of sanitary appliances installation
<b>Learning outcome 1: Prepare materials, tools and equipment</b>	<b>Learning hours: 3</b>
<b>Indicative content</b>	
<ul style="list-style-type: none"> <li>• <b>Identification of tools used for plumbing work</b> <ul style="list-style-type: none"> <li>➤ The use of plumbing work tools</li> <li>➤ The maintenance of plumbing work tools</li> </ul> </li> <li>• <b>Identification of equipment for plumbing work</b> <ul style="list-style-type: none"> <li>➤ Sprayer machine with accessories</li> <li>➤ Grading machine</li> <li>➤ PPE</li> <li>➤ Use of plumbing work equipment</li> </ul> </li> <li>• <b>Identification of materials used for plumbing work</b> <ul style="list-style-type: none"> <li>➤ Types of materials used for plumbing work</li> <li>➤ Properties of Materials</li> </ul> </li> </ul>	
<b>Resources required for the learning outcome</b>	
Equipment	Pipe bender, Electric drill, Tubing cutter, Steel pipe threading , RS EAS 1022: Hacksaw blades — Specification
Materials	Silicone Rubber, Teflon, Epoxy resin, Ethylene Propylene Diene Monomer (EPDM), Polyvinyl Chloride (PVC), PVC-U (unplasticized), PVC-C 9Chlorinated), PVC-P (Placitized), Polyethylene (PE), RS ISO 2284: Hand taps for parallel and taper pipes threads-General dimensions and making, RS ISO 4427-5: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 5: Fitness for purpose of the system, RS ISO 4427-3: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings, RS ISO 4427-2: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 2: Pipe, RS ISO 4427-1: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 1: General specification, RS ISO 15874-2: Plastics piping systems for hot and

	cold-water installations — Polypropylene (PP) — Part 2: Pipes, RS ISO 2531: Ductile iron pipes, fittings, accessories and their joints for water applications, RS ISO 6594: Cast iron drainage pipes and fittings — Spigot series
Tools	Trowel, Spirit level, Squares, Building line, Tape measure, Wheelbarrow, Roller brush, Hand brush, Scrapper, Tray , Steel float, Sand paper, Pan/bucket, Extension pole, Mixing stick, Strings (Road marking line), Brushes, Paint Scrapper, Roller, Roller tray and Bucket/pan
Facilitation techniques	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Trainer guided</li> <li>• Matching questions</li> <li>• Multiple choice</li> <li>• Practical exercises</li> <li>• Short questions</li> <li>• Essay</li> <li>• Open ended questions</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Performance assessment</li> </ul>

<b>Learning outcome 2: Demonstrate basics of pipe connections</b>	<b>Learning hours: 10</b>
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**Indicative content**

- **Selection of pipes**
  - Identification of plumbing pipes
    - ✓ Methods of Physical properties of steel pipes
    - ✓ Physical properties of copper pipes
    - ✓ Physical properties of PVC
- **Assembling of pipes**
  - Identification of plumbing drawing
  - Sanitary appliances symbols
  - Marking of plumbing elements
- **Making pipe joints**
  - Types of directions in pipe connection
  - Cutting pipes with a hacksaw /pipe cutter
  - Cutting threads on pipes
  - Assembling of joints and threaded taps

- Making a joint on two distant pipes

### Resources required for the indicative content

Equipment	Pipe bender, Electric drill, Tubing cutter, Steel pipe threading , RS EAS 1022: Hacksaw blades — Specification
Materials	Silicone Rubber, Teflon, Epoxy resin, Ethylene Propylene Diene Monomer (EPDM), Polyvinyl Chloride (PVC), PVC-U (unplasticized), PVC-C 9Chlorinated), PVC-P (Placitized), Polyethylene (PE), RS ISO 2284: Hand taps for parallel and taper pipes threads-General dimensions and making, RS ISO 4427-5: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 5: Fitness for purpose of the system, RS ISO 4427-3: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings, RS ISO 4427-2: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 2: Pipe, RS ISO 4427-1: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 1: General specification, RS ISO 15874-2: Plastics piping systems for hot and cold-water installations — Polypropylene (PP) — Part 2: Pipes, RS ISO 2531: Ductile iron pipes, fittings, accessories and their joints for water applications, RS ISO 6594: Cast iron drainage pipes and fittings — Spigot series
Tools	Trowel, Spirit level, Squares, Building line, Tape measure, Wheelbarrow, Roller brush, Hand brush, Scrapper, Tray , Steel float, Sand paper, Pan/bucket, Extension pole, Mixing stick, Strings (Road marking line), Brushes, Paint Scrapper, Roller, Roller tray and Bucket/pan
Facilitation techniques	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Trainer guided</li> <li>• Matching questions</li> <li>• Multiple choice</li> <li>• Practical exercises</li> <li>• Short questions</li> <li>• Essay</li> <li>• Open ended questions</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Performance assessment</li> <li>• Product based assessment</li> </ul>

**Indicative content**

- **Installation of water closets (W.C)**
  - Types of water closets (W.C)
  - Parts of Water Closets Apparatus
  - Water Closets Apparatus Installation Steps
  
- **Installation of bathtubs**
  - Types of bathtubs
  - Parts of bathtubs
  - Bathtubs installation steps
  
- **Installation of sinks**
  - Types of sinks
  - Parts of Sink
  - Sink Installation steps
  
- **Installation of rain water harvesting**

**Resources required for the indicative content**

Equipment	Pipe bender, Electric drill, Tubing cutter, Steel pipe threading , RS EAS 1022: Hacksaw blades — Specification
Materials	Silicone Rubber, Teflon, Epoxy resin, Ethylene Propylene Diene Monomer (EPDM), Polyvinyl Chloride (PVC), PVC-U (unplasticized), PVC-C 9Chlorinated), PVC-P (Placitized), Polyethylene (PE), RS ISO 2284: Hand taps for parallel and taper pipes threads-General dimensions and making, RS ISO 4427-5: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 5: Fitness for purpose of the system, RS ISO 4427-3: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings, RS ISO 4427-2: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 2: Pipe, RS ISO 4427-1: Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 1: General specification, RS ISO 15874-2: Plastics piping systems for hot and cold-water installations — Polypropylene (PP) — Part 2: Pipes, RS ISO 2531: Ductile iron pipes, fittings, accessories and their joints for water applications, RS ISO 6594: Cast iron drainage pipes and fittings — Spigot series
Tools	Trowel, Spirit level, Squares, Building line, Tape measure, Wheelbarrow, Roller brush, Hand brush, Scrapper, Tray , Steel float, Sand paper, Pan/bucket, Extension

	pole, Mixing stick, Strings (Road marking line), Brushes, Paint Scrapper, Roller, Roller tray and Bucket/pan
Facilitation techniques	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Demonstration and simulation</li> <li>• Individual and group work</li> <li>• Practical exercise</li> <li>• Individualized</li> <li>• Trainer guided</li> <li>• Group discussion</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Performance assessment</li> <li>• Product based assessment</li> <li>• Project based assessment</li> </ul>

## References:

1. Black & Decker. The Complete Guide to Home Plumbing. Minnetonka: Creative Publishing,1998
2. Burkybile, Carl Designing, Installing, Maintaining and Repairing Plumbing Systems.University of Illinois: Information Technology & Communication Systems
3. Hogan, Elizabeth L. Basic Plumbing Illustarted. Menlo Park, California: Suset Publishing Corp,1992
4. Robert N., P.E. Reid, Water quality and systems: a guide for facility managers, 2003 Fairmont Press
5. Roy Chudley, Roger Greeno, Building Construction Handbook, 2014, Routledge
6. Steele, Alfred, Laws, A. Calvin, Engineered Plumbing Design II,2004, American Society of Plumbing Engineers (ASPE)