



UGANDA BUSINESS AND TECHNICAL EXAMINATIONS BOARD

**MODULARISED ASSESSMENT SYLLABUS FOR
NATIONAL CERTIFICATE IN PLUMBING
(June 2022 edition)**

June 2022

1.0 PREAMBLE

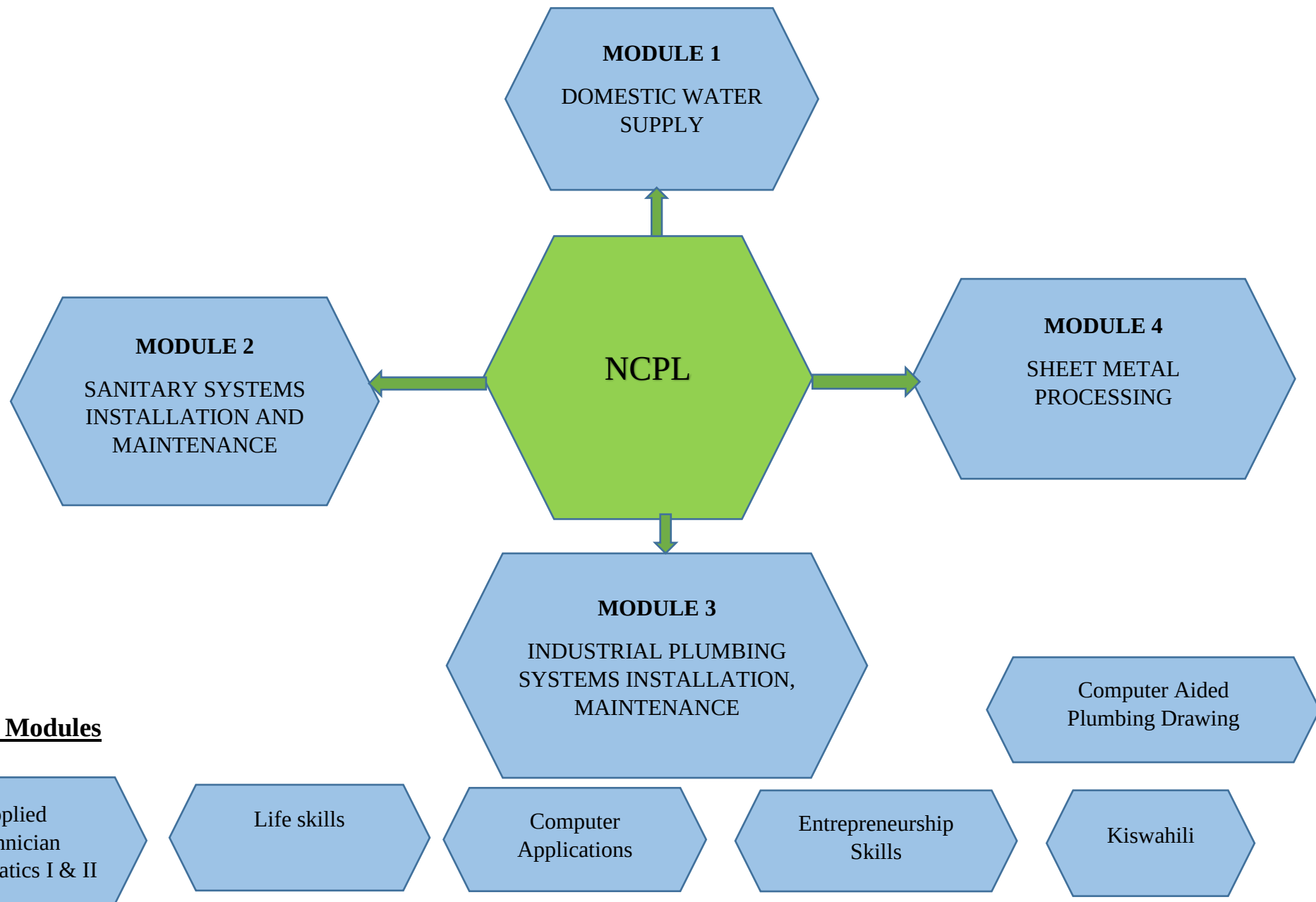
The Ministry of Education and Sports is spearheading modularization of assessment as part of the implementation of the Technical and Vocational Education Training (TVET) policy, 2019 reforms.

This Modular Assessment Syllabus (MAS) was derived from the National Curriculum Development Center (NCDC) curriculum of National Certificate in Plumbing (2016) which is currently being taught and assessed for trainees.

The syllabus looked at related content in the curriculum and realigned it into **four (4) core modules** of; Domestic Water Supply, Sanitary Systems Installation and Maintenance, Industrial Plumbing Systems Installation and Maintenance, and Air Conditioning and Sheet Metal Processing emphasizing skills acquisition for the workforce to stimulate service delivery and infrastructural development both in private and public sectors. Each module will also have Real Life Project and Industrial Training. **Six (6) support modules** have been identified and included which have to be done by trainees who wish to pursue further education and will be done at the end of each respective years of study as it was in the NCDC curriculum (2016). The support modules include; Applied Technician Mathematics I & II, Life Skills, Computer Applications, Kiswahili and Entrepreneurship Skills. Computer Aided Plumbing Drawing has also been included which will be taught and assessed at the end of the second year as it was in the NCDC curriculum (2016).

The modules are flexible and allow candidates interested in academic progression to join at any time while participating in productive activities for community transformation.

2.0 IDENTIFIED MODULES/COMPETENCY AREAS



3.0 MODULE DESCRIPTION

3.1 MODULE 1 NAME: DOMESTIC WATER SUPPLY

3.2 Expected Outcome: The trainee shall be able to install, maintain and repair domestic water supply systems.

3.3 Tasks and Duties:

- i) Identify materials used in Domestic Water Supply.
- ii) Measure, mark, cut, fix and lay water supply pipes.
- iii) Determine the sizes of pipes used in Domestic Water Supply.
- iv) Carryout excavations for pipe works.
- v) Lay pipes for water supply.
- vi) Determine fixing heights for storage cisterns.
- vii) Test domestic water supply systems.
- viii) Observe health and safety in work place.
- ix) Use and maintain plumbing tools and equipment.
- x) Set border lines on different drawing paper sizes
- xi) Design title blocks for various drawing papers
- xii) Apply Geometrical principles into the Plumbing field
- xiii) Operate a computer to produce the drawings.

3.4 MODULE 2 NAME: SANITARY SYSTEMS INSTALLATION AND MAINTENANCE

3.5 Expected Outcome: The trainee shall be able to install, maintain and repair sanitary systems.

3.6 Tasks and Duties:

- i) Identify materials used in Sanitary Systems.
- ii) Determine the sizes of pipes for sanitary appliances.
- iii) Carryout excavations for drainage work.
- iv) Lay drainage pipes.
- v) Determine fixing heights for sanitary appliances.
- vi) Measure, Mark, fix and maintain sanitary appliances/systems
- vii) Select materials for sanitary appliances.
- viii) Lay drainage systems as per the drainage regulations.
- ix) Install sanitary appliances at recommended fixing heights.
- x) Connect drainage fittings.
- xi) Lay drainage pipes to appropriate gradients.
- xii) Excavate trenches for the drainage pipe network.

3.7 MODULE 3 NAME: INDUSTRIAL PLUMBING SYSTEMS INSTALLATION AND MAINTENANCE.

3.8 Expected Outcome: The trainee shall be able to select the suitable materials required for specific job to meet the expected standard results in the industry setting, install, maintain and repair both industrial plumbing as well as air conditioning systems.

3.9 Tasks and Duties:

- i) Identify materials used in Industrial Plumbing Systems.
- ii) Carryout excavations for pipe work in industrial setting.
- iii) Fix industrial plumbing systems.
- iv) Treat water and make it palatable for human consumption.
- v) Operate/maintain various types of pumps.
- vi) Service air conditioning appliances.
- vii) Apply health and safety on job in industrial setting
- viii) Observe potential risks at work place
- ix) Identify the building team and their roles.
- x) Form various shapes by measuring, cutting and filing of metals.
- xi) Demonstrate the principles of water filtration.
- xii) Calculate the pressure and volumes of gases
- xiii) Service pipework for air conditioning systems

3.10 MODULE 4 NAME: SHEET METAL PROCESSING

3.11 Expected Outcome: The trainee shall be able to make different sheet metal products, maintain and repair sheet metal articles.

3.12 Tasks and Duties:

- i) Identify materials used in both Sheet Metal Processing.
- ii) Repair and Maintain articles made of sheet metals.
- iii) Carryout soldering and riveting of sheet metals.
- iv) Weld different kinds of metals by applying both gas and arc welding principles.
- v) Measure, mark and cut and join sheet metals to shapes
- vi) Fabricate shapes to form soakers, gutters and water down pipes.
- vii) Make seams between pipe joints

4 LEARNING CONTENT AND COMPETENCIES FOR DOMESTIC WATER SUPPLY MODULE

Submodules	Competencies	Indicative Syllabus Content	Duration (Contact Hours)
Introduction to Plumbing	• Describes the originality of plumbing and its importance to humanity. • Carries out the roles of a plumber. • Analyses the difference between health and safety. • Identifies possible causes of accidents on sites/ in workshops and suggests the possible ways of limiting them. • Identifies possible areas prone to accidents in every working situation. • Sensitizes workmates, managers and the public on ways of limiting accidents. • Fights fire using water jets, sand and fire extinguishers. • Administers first aid to accident victims. • Communicates effectively, the body parts failures (heart, breathing, paralysis, epilepsy, convulsion, fainting), and suggests the possible remedies. • Differentiates between tools and equipment used in plumbing. • Identifies and uses the electric power tools used by plumbers. • Troubleshoots faults in electric tools and maintains them. • Takes record of the tools issued out and returned to the store.	• Plumbing and its origin • Roles of a plumber • Safety, Health and Hygiene • Plumbing tools and equipment	30 Hours
Plumbing Materials	• Identifies the ferrous and non-ferrous metals.	• Materials used in Plumbing Work	24 Hours

	• Selects and uses the correct metal based on its properties. • Selects the suitable plastic for use based on the required properties. • Selects and uses the correct pipe jointing material. • Lays water mains to final positions. • Advises the client on the suitable materials basing on the required properties. • Identifies effects of heat on plastics and suggests the correct treatment. • Analyses the behavior of different types of plastics. • Selects and uses plastic materials appropriately.	• Plastics	
Water Supply	• Illustrates the hydrological water cycle using sketches. • Describes the process involved in the hydrological cycle. • Differentiates between surface and underground water sources. • Identifies the types of water obtained from surface and underground sources. • Tests the quality of water. • Protects water from surface and sub-soil pollution. • Installs cold water systems in a building. • Differentiates between direct/constant, indirect/intermittent and modified indirect cold-water systems. • Installs water meters. • Reads water meters. • Identifies various types of taps and connects them. • Installs storage cisterns.	• Sources of Water Supply • cold water supply systems/Pipe Fittings ✓ Tapping and making connections ✓ Pipe processing ✓ Water supply to sanitary appliances • Siphonage • Water Hammer • Hydraulics • Hot water systems • Water heaters and boilers	174 Hours

	• Applies water works regulations. • Services taps and valves. • Detects common faults in cold water. • Installs hot water systems in a building. • Differentiates between direct and indirect hot water systems. • Installs boilers, boiler mountings and safety valves. • Installs combined cylinder and tank systems. • Applies water works regulations. • Analyses the causes and effects of water hammer on appliances. • Develops methods of limiting water hammer. • Identifies and selects air vessels used in plumbing to control water hammer. • Applies siphon action to influence the flow of liquids through tubes. • Differentiates between siphonage and siphon. • Guards against unwanted capillarity in the installations. • Carries out capillarity experiment using narrow surfaces and tubes of various radii. • Differentiates cohesion from adhesion. • Applies cohesion and adhesion during the jointing of pipes and other accessories. • Applies the formula to determine the effective length of flow of liquids in pipes and the number of connections/branches made on the main pipe and the diameters. • Determines hydraulic mean depth of pipes flowing half/full bore and gradient/inclination.		
--	---	--	--

	• Determines the types of flow in pipes (Reynolds number). • Applies the derived formula to calculate flow rates in pipes and channels. • Determines the factors affecting the flow of liquids in a pipeline in fittings expressed as equivalent of pipe length.		
Applied Plumbing Science	• Measures and controls temperature of plumbing fittings. • Uses various types of thermometers to read the scale of temperature. • Determines the upper and lower fixed points. • Converts temperature from Degrees Fahrenheit (°F) to Degrees Centigrade (°C) and vice versa. • Describes corrosion, identifies its causes and controls it. • Researches on methods of preventing corrosion. • Paints surfaces liable to corrode. • Provides adequate concrete cover to reinforce steel bars and other corroding metals. • Analyses the advantages and disadvantages of friction in plumbing field. • Applies friction in sharpening chisels, grooving and threading pipes. • Calculates heat quantity. • Applies the principle of heat transfer in heating water. • Measures the amount of heat required to change temperature of an object. • Performs heat loss calculation on structures.	• Temperature • Corrosion • Friction • Heat • Pressure • Speed, Velocity and Acceleration	72 Hours

	• Ignites controlled combustion using different types of fuel. • Applies heat treatment methods to bend pipe fittings. • Identifies and selects material with high and low thermal conductivity. • Applies insulation knowledge in controlling temperature. • Determines intensity and total pressure. • Determines atmospheric pressure. • Applies standard measurements of pressure. • Measures time and distance taken to flow from one end to another. • Determines velocity of liquids.		
Plumbing Drawing	• Uses drawing instruments. • Sets the sheets. • Draws border lines and title blocks using straight lines. • Prints numbers, letters and words. • Draws symbols for pipe work and plumbing fixtures. • Applies all types of line in drawing. • Constructs angles, triangles and quadrilaterals to a given scale using the drawing equipment. • Constructs regular polygons to scale. • Inscribes and circumscribes triangles and polygons into the other. • Enlarges and transforms figures, circles, ellipses and tangents to a given shape. • Draws the developments of parallel and radial lines.	• Introduction to Drawing • Types of Lines • Geometrical Construction • Construction of Regular Polygons • Development of Polygons • Developments of Shapes • Interpenetration • Orthographic Projection • Principles of Isometric Projection • Oblique Projections	90 Hours

	• Draws the development of various fittings (elbow, T- and Y- junctions). • Draws the development of a cylinder. • Draws the development of a cone and truncated cone. • Draws the development of a square bend of two to three pieces. • Draws the development of a funnel. • Draws the development of a scoop. • Develops and draws intersection of branch pipes of same diameter. • Develops and draws intersection of branch pipes of unequal diameter. • Illustrates the symbols used on 1st and 3rd angle orthographic projections using sketches and drawings. • Draws orthographic projections of water closets, cisterns, manholes, septic tanks, sinks and pipe fittings. • Describes the principle of 3D/isometric sketches and drawings. • Differentiates between isometric and oblique projections. • Sketches and draws rectangles, cubes, cylinders, circles, cones in 3D and isometric. • Prints and carries out lettering on drawings. • Carries out the dimensioning of the drawings. • Hatches the drawings. • Sets the drawing sheet. • Draws to given scale.		
--	--	--	--

	draws parallel projection in which an object appears to be rotated to show all its three dimensions.		
	TOTAL		390 Hours

ASSESSMENT STRATEGIES FOR DOMESTIC WATER SUPPLY MODULE

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practical (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination; Examination paper names and codes shall be as follows:

(i) NCPL 111 DOMESTIC WATER SUPPLY THEORY

This paper will consist of **three** sections **A, B** and **C**. **Section A (Plumbing technology and materials)** will consist of **five (5)** questions each carrying 20 marks and the trainee will be required to answer **any three (3)** questions. **Section B (Plumbing drawing)** will consist of **two (2)** questions each carrying 20 marks and the trainee will be required to answer **one (1)** question. **Section C (Applied plumbing science)** will consist of **two (2)** questions each carrying 20 marks and the trainee will be required to answer **one (1)** question.

The marks from this examination will be converted to 60% and added to the coursework assessment.

The duration for this examination paper will be **three (3) hours**.

(ii) NCPL 112 DOMESTIC WATER SUPPLY PRACTICE

This paper will consist of **one compulsory practical question**.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **6 hours**.

4.1 LEARNING CONTENT AND COMPETENCIES FOR SANITARY SYSTEMS INSTALLATION AND MAINTENANCE

Submodules	Competencies	Indicative Syllabus Content	Duration (Contact Hours)
Introduction to Sanitary Systems	- Identifies categories of sanitary appliances and the fixing heights. - Selects and installs waste pipes for a particular number of users. - Installs waste water preventers, automatic flushing cisterns, flushing valves and troughs. - Identifies sanitary traps used in domestic and industrial installations. - Locates WC and other appliances in an apartment. - Differentiates surface and ground drainage systems. - Installs surface ground drainage systems. - Describes principles of above ground drainage systems. - Tests surface and underground drainage systems. - Describes the various terms used in underground drainage. - Identifies and selects materials used for drainage construction. - Joints pipes. - Installs underground drainage pipes and accessories. - Determines the depth of cover for drains in different areas and their gradients. - Ventilates drains and observes safety and health regulations. - Tests underground drainage systems. - Identifies and selects fittings and accessories used for underground drainage systems. - Identifies the best ways of disposing of sewage.	- Sanitary Appliances - Surface Drainage - Underground Drainage - Timbering to Trenches	76 Hours

	• Constructs disposal units for waste and soil matters. • Differentiates shallow, deep, drop, ramp, intermediate and sample manholes. • Locates where manholes are positioned on the drainage system. • Constructs manholes. • Determines the capacity of non-water borne systems. • Makes safety notices and displays them in convenient places. • Puts on protective gears while on job. • Erects open and closed timbering for trenches.		
Sanitary Appliances Installation	• Interprets working drawings and instructions. • Fixes wash hand basin (WHB), sinks, flushing cisterns, water closets (WC), shower poses, urinals. • Uses the correct sequences of operation during the installation of fittings. • Secures the appliance to square. • Connects water lines to an appliance. • Marks and cuts pipes according to the dimension. • Uses the die and stocks for cutting threads in/on pipe. • Cold bends pipes to required angles. • Hot bends pipes to required angles. • Performs different pipe jointing practices. • Detects and rectifies leakages. • Excavates trenches and taps water from stand taps. • Chases the wall to lay pipes. • Installs pipes on chased portion of the wall and plasters with well mixed mortar. • Uses clips to support exposed pipes (observe the rules).	• Fixing of Sanitary Appliances. • Maintenance of Appliances and Fittings • Pipe Processing • Drainage Works for Domestic and Industrial • Construction of Manholes	76 Hours

	• Surveys correct position for cold water storage cisterns. • Detects and rectifies leakages. • Handles the installations. • Identifies faults in a plumbing installation. • Develops sketches of the replacement. • Identifies the causes of the fault. • Replaces and repairs faults. • Surveys the suitable routes for the water mains. • Excavates trenches and lays water mains. • Identifies various storage vessels. • Threads pipes (both PVC and GI) using die and stock. • Bends pipes to required angles. • Joins pipes from 25mm to 38mm. • Forms sockets on pipes from 25mm to 38mm. • Sets and excavates the ground. • Uses the water level for determining the level the trench bases to prescribed gradients. • Lays and joints the pipes. • Tests the pipes using smoke and water tests. • Sets and excavates the manhole trenches. • Uses the water level for levelling the trench bases. • Finishes the manhole by rendering and fixing of step iron. • Makes the suitable concrete manhole cover.		
Applied Sanitary Systems Science	• Analyses matter and differentiates between the states of matter. • Identifies the properties of solids, liquids and gases and their application. • Applies solvent cement and glue in the liquid state to join the pipes. • Determines volume, mass, density and weight of a specific matter.	• Matter • Volume, Mass, Density and Weight • Acids, Bases and Salts • Heat • Flow in drains and open channels	88 Hours

	• Carries out measurement of regular objects using the rule. • Carries out measurements of regular and irregular objects using weighing machine. • Determines the volume and density of irregular objects using archimedes principle. • Identifies and analyses the properties of acids, bases and salts. • Describes the effects of acids, bases and salts on plumbing materials. • Differentiates between efflorescence and deliquescence. • Determines water of crystallization. • Calculates heat quantity. • Applies the principle of heat transfer in heating water. • Measures the amount of heat required to change temperature of an object. • Performs heat loss calculation on structures. • Ignites controlled combustion using different types of fuel. • Applies heat treatment methods to bend pipe fittings. • Identifies and selects material with high and low thermal conductivity. • Applies insulation knowledge in controlling temperature. • Measures time and distance taken to flow from one end to another. • Determines velocity of liquids. • Determines the size of pipe connection. • Derives Chezy's formula of fluid flow. • Uses Chezy's formula of fluid flow to determine the amount of fluid in a given vessel. • Derives and applies Manning's, Crimp and Bruges formula in determining flow of fluids in vessels. • Identifies different types of hydraulic rams.	• Hydraulic Rams • Water	
--	--	---	--

	• Identifies factors to be considered for the choice of a ram. • Applies the working principles of hydraulic rams. • Analyses the operation of different types of pumps. • Selects the right type of pump based on the environment. • Maintains pumps. • Determines pump capacity by discharge. • Calculates mechanical power provided by the pump on the fluid. • Analyses the properties and types of water. • Carries out tests on water for cleanliness and purity.		
	TOTAL		240 Hours

ASSESSMENT STRATEGIES FOR SANITARY SYSTEMS INSTALLATION AND MAINTENANCE MODULE

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practical (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) **NCPL 121 SANITARY SYSTEMS INSTALLATION AND MAINTENACE THEORY**

This paper will consist of **five compulsory** questions each carrying 20 marks

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

(ii) **NCPL 122 SANITARY SYSTEMS INSTALLATION AND MAINTENACE PRACTICE**

This will consist of **one compulsory practical question**.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **6 hours**.

4.2 LEARNING CONTENT AND COMPETENCIES FOR INDUSTRIAL PLUMBING SYSTEMS INSTALLATION AND MAINTENANCE.

Submodules	Competencies	Indicative Syllabus Content	Duration (Contact Hours)
Introduction to Industrial Plumbing Systems	• Upholds clean environment at sites and workshops. • Washes, dries and oils the tools and equipment after the day's work. • Takes note of safety precautions on sites and in workshops. • Separates hazardous waste from the non-hazardous waste. • Identifies toxic gases, liquids, powder/foam, and metals/solids. • Identifies narcotic drugs which are dangerous to human body. • Educates the workmates and the public on the dangers of narcotic drugs. • Prevents accidents. • Suggests the general safety precautions to be observed on sites and in workshops. • Applies the safety precautions while on job and observes the potential risks at the workplace. • Identifies and states the roles of different personnel in a building team. • Estimates the quantity of materials in reference to the work at hand. • Costs materials as per standing rate and makes bills of quantities.	• Safe Job Analysis (SJA) • Building Team	16 Hours

	• Advises the client correctly on suitable materials for the work at hand. • Makes safety notices and displays them in convenient places. • Puts on protective gears while on job.		
Water and Pumping Systems	• Marks, cuts a pipe and threads GI and PVC pipes. • Displays warning notices and gazettes the danger zones. • Writes talking safety messages for public awareness on safety and conformity on cards and displays them in convenient areas. • Writes and pins notices about industrial hygiene and noise as routine reminders. • Sorts and classifies waste according to its type by separating hazardous from non-hazardous waste. • Identifies the possible handling techniques and management of waste. • Surveys the correct positions for the construction of surface drainage. • Sets gradients for surface drainage. • Builds catchment areas for silts and other matter flowing in surface drainage. • Describes the physical appearance of water. • Identifies water pollutants. • Carries out tests on water impurities. • Describes different methods of water treatment. • Describes stages of water treatment in different methods. • Performs simple water treatment. • Describes different types of water reservoirs.	• Safe Working Practices • Environmental Concerns and Waste Management • Water Treatment • Pumps • Gas laws	86 Hours

	• Determines capacity of simple domestic reservoirs. • Analyses the operation of different types of pumps. • Selects the right type of pump based on the environment. • Maintains pumps. • Determines pump capacity by discharge. • Calculates mechanical power provided by the pump on the fluid. • Describes Boyle's law and Charles law. • Applies Boyle's law and Charles law in plumbing work.		
Air Conditioning and Refrigeration	• Installs air conditioning systems. • Troubleshoots air problems and suggests the suitable solution. • Services air conditioning systems. • Analyses functions of refrigerator parts. • Solders copper pipes. • Selects refrigerators based on the expected uses. • Identifies the suitable position for air conditioners and refrigerators. • Lays and installs the air conditioning pipes. • Fixes air conditioning units. • Unseals compressors. • Dismantles and assembles air conditioning units. • Services refrigerators and air conditioning components. • Bends copper coils to the required shape.	• Air Conditioning and Refrigeration • Installation and Servicing of Air Conditioners and Refrigerators	18 Hours
	TOTAL		120 Hours

ASSESSMENT STRATEGIES FOR INDUSTRIAL PLUMBING SYSTEMS INSTALLATION AND MAINTENANCE MODULE

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practical (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) NCPL 211 INDUSTRIAL PLUMBING SYSTEMS INSTALLATION AND MAINTENANCE THEORY

This paper will consist of **five compulsory** questions each carrying 20 marks.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

(ii) NCPL 212 INDUSTRIAL PLUMBING SYSTEMS INSTALLATION AND MAINTENANCE PRACTICE

This will consist of **one compulsory practical question**.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **6 hours**.

4.3 LEARNING CONTENT AND COMPETENCIES FOR SHEET METAL PROCESSING

Submodules	Competencies	Indicative syllabus Content	Duration Contact hours
Sheet Metal Processing	• Classifies tools according to their use. • Uses tools correctly. • Cares and stores tools well. • Selects and uses the appropriate forging tools, equipment and materials. • Sets the correct heat temperatures. • Fabricates hawk saw frames. • Chooses the correct moulds for the required tools. • Applies safety precautions and rules. • Designs, measures and cuts accurately pieces to designed dimensions. • Joins the shapes appropriately. • Bends the cut pieces to correct measured angles. • Develops sheet metal products. • Selects the suitable material and prepares welts, soakers and seams. • Fabricates gutters. • Selects materials for soldering. • Prepares the surfaces ready for soldering. • Rivets articles and joints • Describes gas welding and its welding process. • Identifies, selects and describes the materials used in gas welding. • Differentiates between acetylene and oxy gas cylinders. • Prepares pipe surfaces ready for joining. • Adjusts acetylene and oxy gases to correct pressures and ratio.	• Bench work • Basic Forge work • Sheet Metal Processing • Soldering and Riveting • Gas Welding • Arc Welding	120 Hours

	• Joins pipes by gas welding. • Selects correct welding material for the type of welding. • Prepares welding surface. • Maintains the welding arc.		
	TOTAL		120 Hours

ASSESSMENT STRATEGIES FOR SHEET METAL PROCESSING MODULE

This module will consist of two papers including a theory and a practical. Each of the papers will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practical (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

(i) NCPL 221 SHEET METAL PROCESSING THEORY

This paper will consist of **five compulsory** questions each carrying 20 marks.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

(ii) NCPL 222 SHEET METAL PROCESSING PRACTICE

This will consist of **one compulsory practical question**.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **6 hours**.

MODULE: APPLIED TECHNICIAN MATHEMATICS I

TCTM 101: Applied Technician Mathematics I

Duration: 40 Hours

Module Overview

This module enables the learner to attain some mathematical skills that will facilitate him/her to carry out measurements and estimates as well as have the foundation knowledge required for upgrading. It introduces the learner to calculate the cost of materials, solve problems related to fractions, decimals, percentages, ratios and proportions, areas and volumes of different figures as well as apply the laws of indices and logarithms. This module partly proceeds to Term Two.

Learning Outcomes

By the end of this module, the learner should be able to:

- convert metric units and use them in costing of materials.
- calculate the areas and volumes of various objects.

Competences

The learner:

- converts millimetres to metres and kilogrammes to newtons and tones.
- calculates numbers involving highest common multiple (HCM) and lowest common multiple (LCM).
- calculates percentages in relation to material costing.
- calculates areas of irregular objects using Simpson, mid ordinate and trapezoidal rules.
- interprets the drawings by taking scale rule measurements.
- costs the bricks and cement using the areas and volume calculation methods.
- uses the areas and volume calculation methods to cost the materials for a given task.
- applies the laws of indices in solving indicial equations.
- rationalises and manipulates indicial equations.
- evaluates the logarithms.

Detailed Module Description	Duration
Sub-module 1: Basic SI Units and Arithmetic Algebra • Metric conversion of SI units • Fractions (LCM and HCM) and decimals • Percentages, ratios and proportions	08 Hours
Sub-module 2: Mensuration • Calculation of area, perimeter, volume and total surface area for regular and irregular figures	12 Hours
• Interpretation of given drawings/diagrams • Cost calculations • Areas of irregular figures [Simpson rule, mid ordinate rule, trapezoidal rule]	

Sub-module 3: Indices and Logarithms • Laws of indices and standard form, fractional indices, negative indices • Indicial equation • Multiplication and division of indices • Rationalization and equations involving indices • Rules of logarithms • Common logarithms, change of base • Equations involving logarithmic functions, exponential functions and logarithmic graphs • Natural logarithms	20 Hours
--	----------

TCTM 101: Applied Technician Mathematics I

Duration: 40 Hours

Module Overview

The module introduces the learner to trigonometry, matrices and their application in engineering. It gives the learner the knowledge used in setting out structures and positioning of the technician's ladder/scaffolds to safer leaning angles. This module continues to Term Three.

Learning Outcome

By the end of this module, the learner should be able to apply trigonometry to set out simple templates and pipe bends.

Competences

The learner:

- describes Pythagoras theorem and calculates the sine, cosine and tangent of a right-angled triangle.
- calculates the ladder safe leaning angles and roof pitches.
- manipulates trigonometrically, ratios of 300, 450, 600 and their application in finding the areas of plots of land and other surfaces.
- draws trigonometric graphs.
- calculates the heights and other distances or sides of triangles.
- determines the areas of roofs and walls using the sine, cosine and tangent formulae.
- adds and subtracts matrices.
- transposes matrices.
- calculates the determinants of matrices.

Detailed Module Description	Duration
Sub-module 4: Trigonometry • The general angle • Pythagoras theorem • Graphs of trigonometrical functions • Trigonometrical ratios of 30°, 45°, 60° • The sine formula • Cosine formula • Tangent formula • Half angle formula • Heights and distances	26 Hours

• Sub-module 5: Matrices • Addition and subtraction of matrices • Multiplication and division of a square matrix • Application, order and types • Transpose and inverse of a square matrix • Solution of sets of linear equations • Determinants	14 Hours
---	----------

TCTM 101: Applied Technician Mathematics I

Duration: 32 Hours

Module Overview

The module introduces the learner to the concepts of complex numbers, vectors and matrices, their relevance in the construction industry and further career upgrading. The knowledge attained in this module shall be more useful when analysing the flow of fluids in pipes.

Learning Outcomes

By the end of the module, the learner should be able to:

- solve equations involving complex numbers.
- evaluate vectors.

Competences

The learner:

- represents the identities applied in complex numbers.
- adds and subtracts complex numbers.
- manipulates equal, polar and exponential forms of equations of complex numbers.
- graphically represents complex numbers to standard forms.
- manipulates equations involving vectors, by addition, subtraction and multiplication.
- represents vectors on graphs.

Detailed Module Description	Duration
Sub-module 6: Complex Numbers • Equal complex numbers • Graphical representation of complex numbers • Polar form of complex numbers • Exponential form of a complex numbers	16 Hours
Sub-module 7: Vectors • Introduction to vector representation • Manipulation of vectors • Types of vectors • Addition of vectors • Subtraction of vectors	16 Hours

ASSESSMENT STRATEGIES FOR APPLIED TECHNICIAN MATHEMATICS I

This module will consist of one written paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (15%)
- Class tests (25%)

The continuous assessment shall consist of:

- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

This paper will consist of eight questions each carrying 20 marks and the trainee will be required to answer **any five** questions.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

MODULE: TCCS 101 LIFE SKILLS

MODULE OUTCOME:

The trainee should be able to write reports, communicate with others and make presentations.

COMPETENCES:

By the end of the module, the trainee should be able to;

- Communicate effectively in the field of work.
- Narrate the order in which events happened and gives objective arguments.
- Prepare seminar documents and makes presentations.
- Prepare a public document and presents it.
- Practice good labour laws and good safety.
- Improve the working environment for effective production and output.

S/N	TASK	CONTENT	DURATION
1.	Interact and communicate with other workers within the work sites and other communities	Sub-module 1: Introduction to Communication Skills • Fundamental skills: ✓ reading, ✓ listening ✓ note taking and note making ✓ speaking and interaction skills • Conducting meetings and interviews • Interpersonal skills • Workplace communication	6 Hours
		Sub-module 2: Writing Skills • Academic writing: - technical and scientific report writing - curriculum vitae and resume writing - authority and delegation letters - writing of circulars • Office and business writing: - intra and inter-office communication - business correspondence and memo writing - advert and announcement writing	10 Hours

		Sub-module 3: Introduction to HIV and AIDS • Background of HIV and AIDS : meaning, definition, history, current trends and prevalence • Myths and misconception on HIV and AIDS • Basic facts on HIV and AIDS. (This sub-module could be left to be covered in Health and safety)	4 Hours
		Sub-module 4: Discourse Writing • Definition and descriptive writing • Comparison and contrast • Narration and arguments	10 Hours
		Sub-module 5: Presentations • Seminar document preparation and presentation • Classroom report preparation and assessment presentations • Public document preparation and presentations	6 Hours
		Sub-module 6: Spread and Control Measures of HIV and AIDS • Modes of transmission • Risk factors • Prevention of HIV and AIDS • Behaviour change	4 Hours
		Sub-module 7: Oral Communication Skills • Listening and speaking • Conducting meetings and interviews • Phone messaging • Customer care language	6 Hours
		Sub-module 8: Working Environment • Labour laws and regulations	4 Hours

		• Health and safety • Environment • Gender and mainstreaming of gender • Population growth / trends • Human rights • Social structure • Economic structure	
		• Sub-module 9: Impact and Interventions of HIV and AIDS • Impact of HIV and AIDS • Interventions to combat HIV and AIDS • Counselling and testing • Treatment, care and support • Mitigation of stigma and discrimination • Disclosure of HIV status • HIV and AIDS workplace policy for Uganda	06 Hours

ASSESSMENT STRATEGIES OF LIFE SKILLS MODULE

This module will consist of one written paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (15%)
- Class tests (25%)

The continuous assessment shall consist of:

- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

This paper will consist of eight questions each carrying 20 marks and the trainee will be required to answer **any five** questions.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

MODULE: TCCA 101 COMPUTER APPLICATIONS

MODULE OUTCOME:

The trainee should be able to connect and use computer in report writing, presentation, print documents and communication through internet.

COMPETENCES:

By the end of the module, the trainee should be able to;

- Identify icons on desktop and their application.
- Start, create or open a Word window.
- Work with text and manage files.
- Use Word menus for document editing, e.g. copy, paste, cut.
- Save a Word document.
- Save a document in different formats and to a storage media, e.g. flash disc.
- Format a page and documents.
- Merge, deletes and inserts excel cells.
- Make the spreadsheets.
- Format spreadsheets for printing.
- Prepare bills of quantities (accounts figures) using excel.
- Apply excel formulae in adding, multiplying, subtracting and dividing calculations.
- Draw charts and graphs using excel and the Internet.
- Prepare work on Ms PowerPoint slides.
- Edit the work on slides.
- Activate animations on the selected slide design.
- Make a PowerPoint presentation.
- Run a full slide show.
- Differentiates between wireless and cable networking.
- Connect a network cable to computers.
- Install network modem to a personal computer (PC).
- Troubleshoot simple network connection problems.
- Write and send email messages.
- Read received mails.
- Draw charts and graphs using the Internet.

- Copy files and save documents from one location to another

S/N	TASK	CONTENT	DURATION
1.	Apply computer office packages in writing reports, data analysis, presentation and use of internet to communicate	Sub-module 1: Introduction to Computer • Origin of computers • Types of computers and computer hardware (central processing unit (CPU), hard disk drives, modem, keyboard, etc) • Computer accessories: scanners, projectors, external speakers • Keyboard basics: function keys, numeric keys and navigation keys • Starting a computer, closing down the computer Computer software: classification, types, usage and computer components; (video card, network cards, cables, read only memory (ROM), random access memory (RAM), monitors, printers, cameras, processors)	10 Hours
		Sub-module 2: Operating System • Functions of an operating system • Types, classification and benefits of operating systems • Installation of Windows operating system and application software	6 Hours
		Sub-module 3: Desktop Main Menu • Start menu • Applications menu • Working with the desktop: background, screen saver • Manipulating open Windows: resizing, maximizing, minimizing, task pane, and tiling Windows, etc • Copying files from different locations Icons, files and folders	04 Hours

		Sub-module 4: Word Processing • Starting, creating and opening a Word window • Working with text • Word menus for document editing e.g. copy, paste, cut • Saving a Word document • Saving a document in different formats and to a storage media, e.g. flash disc • Formatting a page and documents: paper size, background colours • Working with tables: rows and columns • Working with drawings, ClipArt and pictures • Mail merging	20 Hours
		Sub-module 5: Working with Spreadsheets • Creating an excel document • Opening and closing an excel document • Entering data to a worksheet, editing and formatting a datasheet • Using formulas and functions • Creating/plotting charts and graphs from excel data values • Inserting tables to excel worksheet. • Printing a spreadsheet; page setup, gridlines	16 Hours
		Sub-module 6: PowerPoint Presentations • Creating a new presentation • Opening and closing a presentation • Saving a presentation document • Transferring a presentation to a storage media in different formats • Adding and formatting text, pictures and media • Creating and running a slideshow • Printing presentation slides.	14 Hours

		Sub-module 7: Printing, Scanning and Copying Documents • Printing documents • Working with printer cartridges and toners • Scanning documents and pictures • Copying documents	8 Hours
		Sub-module 8: Internet and Electronic Mail • The Internet, web browsers • Opening a website; website address (url) • Internet searching and search engines • Saving information from the Internet, downloading files, music, pictures to the computer • Electronic mail (email): • creating email accounts • email folders and attachments • attaching documents to outgoing email • downloading email attachments from incoming email • formatting mail • searching mail • Printing mail	16 Hours
		Sub-module 9: Basic Networking • Introduction to computer networking • Types of network: wide area networks (WAN), local area network (LAN) • Types of communication media: cables, wireless, optic fibres • Local area network topologies: star, ring, mesh, bar • Connecting a computer to a network • Configuring an Internet Protocol Address (IPA)	18 Hours

		• Creating a simple network of at least two computers • Sharing files between computers on a simple network • Troubleshooting simple connection problems • Connecting and configuring a printer on a network	
--	--	---	--

ASSESSMENT STRATEGIES OF THE COMPUTER APPLICATIONS MODULE

This module will consist of one practical paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practicals (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

This paper will consist of **three practical questions** carrying 50 marks each. The trainee will be required to answer any two questions.

The duration for this paper will be **2 hours**.

MODULE NAME: APPLIED TECHNICIAN MATHEMATICS II

TCTM 201: Applied Technician Mathematics II Duration: 40 Hours	
Module Overview The module introduces learners to equations, elementary polynomial and binomial theorem, their application and importance in the manufacturing industry.	
Learning Outcome By the end of this module, the learner should be able to transform formulae and evaluate variables.	
Competences The learner: • evaluates independent variables. • transposes various formulae. • applies the transposition of formulae in manipulating and solving production related problems. • factorises quadratic equations. • solves polynomial equations by applying the remainder theorem. • solves general polynomial equations. • expresses binomial theorem on Pascal's triangle. • manipulates binomial theorem equations.	
Detailed Module Description	Duration
Sub-module 1: Expressions of Equations • Evaluating expressions • Equations • Evaluating independent variables • Transposition of formulae	12 Hours
Sub-module 2: Polynomial Equations • Polynomial expression, equations of polynomials • Remainder theorem • Factorization of quadratic polynomials	14 Hours
Sub-module 3: Binomial Theorem • Expansion of binomial expressions: Pascal's triangle, the binomial theorem for 'n' a positive integer • The general binomial expansion $(1+x)^n$ for $1 < x < 1$ and for $1 < x > 1$	14 Hours

TCTM 201: Applied Technician Mathematics II

Duration: 40 Hours

Module Overview

The module introduces the learner to engineering calculus used in determining the estimated loads that a structure is expected to carry.

Learning Outcome

By the end of this module, the learner should be able to apply calculus in determining the bending moments of beams and other structures.

Competences

The learner:

- differentiates the variables from first principle.
- differentiates the product and quotient.
- applies differential equations in determining beam deflections.
- applies integral equations to evaluate the extent of beam deflections.
- determines gradient of a curve.
- uses integration principle to determine the size and area of a simple structure.
- adds fractions to get a common denominator.
- manipulates functions in rules.
- applies inverse of a function.
- draws graphs.

Detailed Module Description

Duration

Sub-module 4: Differentiation

14 Hours

- Differentiation from first principle
- Differentiation of product and quotient
- Choice of variable

Sub-module 5: Integration: Single and Double Integrals

16 Hours

- Integration-the reverse of differentiation
- Standard integrals
- Functions of linear function of 'x'
- Integration of polynomial functions
- Integration by partial fractions
- Areas under curves

Sub-module 6: Elementary Functions

10 Hours

- Functions in rules
- Functions and the arithmetic functions
- Inverse of function and graphs

TCTM 202: Applied Technician Mathematics II

Duration: 32 Hours

Module Overview

The module introduces the learner to concepts of set theory as may be applied in mixing ratios and basic statistics used in recording of day work and site progress. The knowledge attained in this module enables the learner to tally any collected data for a particular purpose, leading to a realistic making of an informed decision.

Learning Outcomes

By the end of this module, the learner should be able to:

- apply the set theory in batching and mixing ratios for mortar and concrete.
- apply the skills of illustrating histograms in drawing the site operation programme.

Competences

The learner:

- identifies and groups elements of a set.
- analyses the differences between union, sub-sets and intersection of sets.
- applies set theory in grouping building materials.
- analyses the relationship between set theory with that of ratios and proportions of building materials.
- records information on a frequency distribution sheet.
- determines the average of given data.
- draws histograms representing given information.
- applies the mean arithmetic in analyzing the site activities for monthly salary and overtime allowances of workers.
- applies the assumed mean for calculating standard deviation of materials costs in the market.

Detailed Module Description	Duration
Sub-module 7: Theory of Sets • Elements of sets • Union of sets • Intersection	18 Hours
Sub-module 8 : Basic Statistics • Recording of the information and frequency distribution • Types of averages • Histograms • Calculation of mean • Standard deviation • Assumed mean	14 Hours

ASSESSMENT STRATEGIES FOR APPLIED TECHNICIAN MATHEMATICS II

This module will consist of one written paper which will have a continuous assessment and a final exam.

(c) Continuous assessment (40%)

- Assignments (15%)
- Class tests (25%)

The continuous assessment shall consist of:

- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(d) Final Examination

This paper will consist of eight questions each carrying 20 marks and the trainee will be required to answer **any five** questions.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

MODULE NAME: COMPUTER AIDED PLUMBING DRAWING

TCPL 204: Computer Aided Plumbing Drawing

Duration: 30 Hours

Module Overview

This module equips the learner with the basic knowledge and skills of using a computer to design and draw various fittings as applied in plumbing. It equips the learner with the skills to develop an intended outlook and template of the required fitting and interpret given drawings for effective implementation.

Learning Outcome

By the end of this module, the learner should be able to design and draw plumbing fittings.

Competences

The learner:

- installs automatic computer aided drawing (AutoCAD) into the computer.
- identifies and uses AutoCAD commands during the development of the drawing.
- develops the design perception of some form, makes the sketch and uses AutoCAD to draw it.
- draws the plan, the correct section and the elevations.
- designs and draws the details of fittings and appliances.
- makes the title block and writes supporting specifications for fittings, appliances and schedules.
- prints the complete drawing.

Detailed Module Description

Duration

Sub-module 1: AutoCAD Basics

30 Hours

- Introduction to computer aided drawing (CAD)
- Need for CAD
- AutoCAD commands (lines, offset, trim, extend, erase, mirror, fillet, hatch, scale, dimension, layers, blocks, zoom, chamfer, circle and arcs)
- Designing of rain water pipes, gutters, rain water bends
- Design of brackets for wash hand basins, kitchen sinks and heaters
- Designing of intercepting trap and gully trap

TCPL 204: Computer Aided Plumbing Drawing

Duration: 30 Hours

Module Overview

This module equips the learner with the knowledge and skills of using a computer to construct and develop shapes of various fittings as applied in plumbing.

Learning Outcome

By the end of this module, the learner should be able to design, construct and develop shapes of various fittings as applied in plumbing.

Competences The learner: • designs and draws combined sewer system , separate sewer system and partially separate sewer system • designs septic tank, cesspool and soak away pits • designs and draws manholes and benching • designs open channels, benching and invert • designs concrete and cast iron covers	
Detailed Module Description	Duration
Sub-module 2: Geometric Construction • designing and drawing of combined sewer system , separate sewer system and partially separate sewer system • designs of septic tank, cesspool and soak away pits • designing and drawing of manholes and benching • designs of open channels benching and invert • design of concrete and cast iron covers	30 Hours

TCPL 204: Computer Aided Plumbing Drawing Duration: 24 Hours	
Module Overview This module introduces the learner to the basic skills of designing kitchen sinks, wash basins, tile patterns and waste disposals using CAD software.	
Learning Outcome By the end of this module, the learner should be able to design kitchen sinks, wash basins, tile patterns and waste disposals.	
Competences: The learner: • Applies drawing of timbering to shallow , moderately and deep trenches • Designs kitchen sinks, wash basins, tile patterns and waste disposals • dimensions the drawing. • hatches the drawing.	
Detailed Module Description	Duration
Sub-module 3: Orthographic Projection • Symbols of 1st and 3rd angle orthographic projections • Drawing of timbering to shallow , moderately and deep trenches • Designs of kitchen sinks, wash basins, tile patterns and waste disposals	24 Hours

ASSESSMENT STRATEGIES OF THE COMPUTER AIDED PLUMBING DRAWING

This module will consist of one practical paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (05%)
- Practical (25%)
- Class tests (10%)

The continuous assessment shall consist of:

- Workshop/practical work/expert assignments
- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

This paper will consist of **three practical questions** carrying 50 marks each. The trainee will be required to answer any **two** questions.

The duration for this paper will be **3 hours**.

MODULE: TCBE 201 ENTREPRENEURSHIP SKILLS

MODULE OUTCOME:

The trainee should be able to exhibit the characteristics and qualities of a good entrepreneur, conduct a feasibility study and design a business plan, produce goods/services for sale, market the products, and manage financial and human resources of the business.

COMPETENCES:

By the end of the module, the trainee should be able to;

- Determine the sources of business ideas.
- Scan the environment for business opportunities.
- Generate ideas for the business.
- Select a viable business idea.
- Obtain business rights.
- Exploit business opportunities.
- Register a business.
- Mobilize resources for starting a business.
- Locate a business in a suitable environment.
- Determine the cost of production.
- Set quality standards in production.
- Design appropriate packaging for the product.
- Add value to the product.
- Carry out a market survey.
- Identify the market for the product.
- Apply the 4Ps in marketing a product.
- Distribute products using the most suitable channels.
- Promote the product for sale.
- Maintain basic business records.
- Compute business profits/losses.
- Prepare simple cash flow statements.
- Manage revenues and expenditures to maximise profits.
- Orient the business employees.

- Maintain a motivated workforce.
- Appraise staff.
- Incorporate a compensation policy for his/her employees.
- Share responsibilities with employees.
- Devise means of overcoming barriers to creative thinking.
- Select the most appropriate form of business ownership to operate.
- Prepare a simple business plan.
- Prepare a simple budget for the business.
- Register a business.
- Mobilize resources for starting a business.
- Locate a business in a suitable environment.
- Source for contract information
- Prepare bid documents.
- Comply with the tender requirements.
- Execute contracts economically and efficiently.
- Open and manages a bank account.
- Differentiate between commercial banks and micro-finance institutions.
- Acquire and services a loan.
- Select the most appropriate insurance policy (ies) for the business.
- Observe the insurance principles.
- Manage the challenges encountered in insurance.
- Seek compensation when loss is suffered.
- Recognize the importance of paying taxes.
- Identify the taxes paid by small businesses.
- Calculate the tax payable.
- File tax returns.

S/N	TASK	CONTENT	DURATION
1.	Manage contracts, lobby for financial services for the business, insure the business and pay the taxes.	Sub-module 1: Introduction to Entrepreneurship • Meaning of entrepreneurship • Qualities of an entrepreneur • Entrepreneurial ethics	03 Hours
		Sub-module 2: Environmental Analysis • Meaning of environment • Scanning the environment for business opportunities • Generating business ideas • Evaluation and selection of business ideas • Protection of business (Trademark and patent rights)	10 Hours
		Sub-module 3: Innovation and Creativity • Meaning of innovation and creativity • Characteristics of innovative and creative persons • Forces of innovation • Barriers to creativity and innovation	04 Hours
		Sub-module 4: Business Planning • Forms of small business ownership (Sole proprietorship and Partnership) • Uses of a business plan • Parts of a business plan • Writing a simple business plan • Developing a simple budget	09 Hours
		Sub-module 5: Implementing a Business Plan • Registering a sole proprietorship and partnership • Mobilising business resources ✓ Financial resources ✓ Human resources	04 Hours

		✓ Plant, machinery and equipment • Locating a business	
		Sub-module 6: Production • Production costing • Packaging (Protection , Handling, Preservation and presentation of a product) • Value addition	06 Hours
		Sub-module 7: Marketing • Market survey • Marketing mix - Price, Place, People, Product (4Ps) • Sales promotion	06 Hours
		Sub Module 8: Financial Management • Bookkeeping (recording transactions, source documents, journals, balancing accounts, trial balance, bank reconciliation) • Simple income statement, balance sheet and cash flow statements	12 Hours
		Sub-module 9: Human Resource Management • Orientation • Importance of motivation • Performance appraisal • Compensation in compliance with labour laws • Need for delegation and challenges encountered • Common causes of conflicts in small enterprises • Importance of teamwork • Settling conflicts at workplace	06 Hours
		Sub-module 10: Contracting Process • Sources of contract information • Bid preparation • Contract execution and compliance	06 Hours

		Sub-module 11: Banking • Services offered by commercial banks, micro finance institutions and SACCOs • Types of accounts (savings, current and fixed deposit) • Acquiring and servicing loans	06 Hours
		Sub-module 12: Insurance for Small Businesses • Life assurance and property insurance • Principles of insurance • Process of getting compensation	6 Hours
		Sub-module 13: Taxation • Reasons for paying taxes • Common taxes paid by small businesses - Local service tax - Property tax - Value added tax (VAT) - Income tax - Market dues - Ground rent - Trade licence • Calculating VAT and income tax payable • Filing tax returns	6 Hours

ASSESSMENT STRATEGIES OF ENTREPRENEURSHIP SKILLS MODULE

This module will consist of one written paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (15%)
- Class tests (25%)

The continuous assessment shall consist of:

- Tests

- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

This paper will consist of eight questions each carrying 20 marks and the trainee will be required to answer **any five** questions.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.

MODULE: TCCS 201 KISWAHILI

MODULE OUTCOME:

The trainee should be able to communication in Kiswahili during execution and management of engineering works.

COMPETENCES:

By the end of the module, the trainee should be able to;

- Acknowledge the importance of learning and using Kiswahili language.
- Greet peers, supervisors and others in Kiswahili.
- Name places and people in their capacities.
- Appreciate others by saying thank you and well-done in Kiswahili.
- Count numbers 0-1,000,000 in Kiswahili.
- Identify and names the parts of the human body in Kiswahili.
- Name domestic animals, birds and insects in Kiswahili.
- Mention the days of the week, names the months of the year and tells the true dates.
- Identify and names the tools and equipment and states their uses in Kiswahili.
- Differentiate the responsibilities and tasks performed by technicians in Kiswahili.
- Identify and names the materials used in engineering.
- Develop good attitude towards work, customers and the general public.
- Welcome and handles customers with care and willingness in Kiswahili.
- Advertise the product in Kiswahili.

S/N	TASK	CONTENT	DURATION
1.	Interact and communicate with clients in Kiswahili	Sub-module 1: Introduction to Kiswahili • Origin and spread of Kiswahili • Importance of Kiswahili to Ugandans and other East African countries	2 Hours
		Sub-module 2: Polite Language • Greetings to peers, age mates, parents, elderly and supervisors • Salutations at different times of the day • Appreciation and saying `thank you' for work	18 Hours

		done, gifts, food and so on • Asking for directions, assistance, food and so on • Names of places, like schools, hospitals, markets, garages, roads, airports, water wells, forests, villages, towns, sites, hills • Names of people and professional titles like technicians, nurses, messengers, watchmen, drivers, doctors, teachers and students	
		Sub-module 3: Comprehension • Vowels a e i o u • Consonants b, ch, d, dh, f, g, gh, h, j, k, l, m, n, ng, ny, p, r, s, sh, t, th, v, w, y, z. • Counting and numbers 0-9, 10- 1,000,000 • Daily and common activities and sayings: 'welcome', 'have a seat', 'thank you', 'wish you well', 'sorry' • Parts of the human body like head, legs, hands	10 Hours
		Sub-module 4: General Vocabulary • Names of domestic animals like goats, sheep, cows, pigs, rabbits, dogs, cats • Names of domestic birds like ducks, turkeys, hens • Names of insects like mosquitoes, flies, cockroaches • Months in a year, days of the week, dates and telling time • Names of objects like doors, windows • Common usage of Kiswahili, home and garden activities • Common mistakes to be avoided	10 Hours

		Sub-module 5: Specific Trade (Professional related) Vocabulary - Names of tools and equipment used by a technician - Tasks performed by a technician - Titles of officers in engineering - Names of materials used in engineering	6 Hours
		Sub-module 6: Customer Care and Language - Attitude to customers, public and the job - Public relations and persuasive business language - Advert of products - Handling customers: welcoming them, asking whether they need help, and thanking them	10 Hours

ASSESSMENT STRATEGIES OF KISWAHILI MODULE

This module will consist of one written paper which will have a continuous assessment and a final exam.

(a) Continuous assessment (40%)

- Assignments (15%)
- Class tests (25%)

The continuous assessment shall consist of:

- Tests
- Assignments consisting of;
 - Class work
 - Written questions to be answered from home (homework)
 - Reports from attended industrial visits, documentaries, Field visits and presentations by professionals

The continuous assessment will be monitored and verified using assessment tools/instruments.

This will be done through the tripartite system of assessment.

(b) Final Examination

The paper shall consist of **two** sections; Section **A** (General Kiswahili) and Section **B** (Professional). Section **A** shall consist of **five** questions and a candidate will be required to answer any **three**. Section **B** shall consists of **three** questions and a candidate shall be required to answer any **two**. All questions shall carry equal marks.

The marks from this exam will be converted to 60% and added to the coursework assessment.

The duration for this paper will be **3 hours**.