

Curriculum
For
“Urban Area Planning and
Management “
(Level -3)

18th to 22th April 2022



National Vocational & Technical
Training Commission

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Introduction

Definition/ Description of the training programme for Urban Area Assistant Supervisor

There is an increasing demand of the Urban Area Assistant Supervisor in construction industry. If an individual is planning to pursue a career in Urban Area Planning and Management, this program will be helpful in targeting various industries including Town Planning.

Purpose of the training programme

The purpose of this training is to develop a range of skills and techniques, soft skills and attributes essential for successful performance in construction and mining sector in accordance with industry requirements. Graduates of this program may find employment in local and international industries.

Overall objectives of training programme

The main objective of this training program is to improve the employability of young graduates through qualifying job-related training in the construction and mining sector, and to train them so that they can prove to be an asset to this sector.

Competencies to be gained after completion of course

- Maintain Safety at Workplace
- Process Consumer Complaint
- Perform Basic Plumbing
- Produce Civil Engineering Drawings
- Prepare Rough Cost Estimation
- Collect and Organise Field Survey Data
- Perform Basic Survey and Leveling

Possible available job opportunities available immediately and later in the future

- Urban Area Assistant Supervisor
- Town planning Assistant Supervisor

Trainee entry level

Urban Area Planning and Management (Level - 2) or Equivalent (with English, Urdu, Numeracy, reading and writing skills)

Minimum qualification of trainer

Teaching staff should have Matriculation with one year technical course in (Civil/Architectural) trade and at least five years' experience in Construction Industry. Other formal certification in the surveying and plumbing and having grip on the engineering drawings and computer skills

OR

Teacher should have Level-4 / DAE in Mechanical / Civil with specialization with at least one years' experience in construction industry. Other formal certification in cost estimation and plumbing would be useful in addition to the above.

Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this programme is 1 trainer for 25 trainees.

Medium of instruction i.e. language of instruction

Instruction will be Urdu and English.

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

This curriculum comprises 7 modules. The recommended delivery time is 600 hours. Delivery of the course could therefore be full time, 5 days a week. 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 follow:

No	Module title	Level	Theory		Practical		Total	
			C	Hr.	C	Hr.	C	Hr.
1.	Maintain Safety at Workplace	3	1.0	10	3.0	30	4	40
2.	Process Consumer Complaint	3	1.0	10	3.0	30	4	40
3.	Perform Basic Plumbing	3	2.0	20	9.0	90	11	110
4.	Produce Civil Engineering Drawings	3	1.6	16	8.4	84	10	100
5.	Prepare Rough Cost Estimation	3	1.7	17	6.3	63	8	80
6.	Collect and Organize Field Survey Data	3	2.0	20	6.0	60	8	80
7.	Perform Basic Survey and levelling	3	2.7	27	12.3	123	15	150
Total			12	120	48	480	60	600

Sequence of the Modules

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 needs of Pakistan.

The distribution table is shown below:

Module 1: Maintain Safety at Workplace 40 Hours	Module 2: Process Consumer Complaint 40 Hours	Module 6: Collect and Organize Field Survey Data 80 Hours
Module 4: Produce Civil Engineering Drawings 100 Hours	Module 5: Prepare Rough Cost Estimation 80 Hours	Module 7: Perform Basic Survey and levelling 150 Hours
Module 3: Perform Basic Plumbing 110 Hours		

Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 1: Maintain Safety at Workplace Aim: After successful completion of this module, the trainee is competent in maintaining Safe conditions at workplace	LU1: Maintain safe work condition at site LU2: Perform fire fighting LU3: Carry out basic first aid LU4: Perform Basic electrical work safely at workplace	10	30	40

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 2: Process Consumer Complaint Aim: After successful completion of this module, the trainee is competent in processing consumer complaint	LU1: Respond to consumer complaint LU2: Refer complaint	10	30	40
Module 3: Perform Basic Plumbing Aim: After successful completion of this module, the trainee is competent in performing basic Plumbing	LU1: Identify plumbing tools and equipment LU2: Perform pipe cutting, threading & reaming LU3: Join PPRC pipes and fittings LU4: Join G.I pipes and fittings	20	90	110

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 4: Produce Civil Engineering Drawings Aim: After successful completion of this module, the trainee is competent in producing civil engineering drawings	LU1: Prepare detailed drawings LU2: Prepare layout plan for services	16	84	100
Module 5: Prepare Rough Cost Estimation Aim: After successful completion of this module, the trainee is competent in preparing rough cost estimation	LU1: Prepare rough cost estimate by unit rate method LU2: Prepare rough cost estimate by plinth area method LU3: Prepare rough cost estimate of pipe lines LU4: Prepare rough cost estimate of water supply scheme LU5: Prepare rough cost estimate of sewer scheme LU6: Prepare estimate of urban road/street	17	63	80

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 6: Collect and Organise Field Survey data Aim: After successful completion of this module, the trainee is competent in collecting and organizing field survey data	LU1: Prepare tools for direct data collection LU2: Conduct data collection using direct collection tools LU3: Conduct data collection using existing sources LU4: Organize data	20	60	80
Module 7: Perform Basic Survey and Leveling Aim: After successful completion of this module, the trainee is competent in performing basic survey and leveling	LU1: Perform linear measurements LU2: Perform Demarcation of land by conventional method LU3: Carryout plane table survey LU4: Perform traversing by compass LU5: Perform simple leveling LU6: Carry out Fly Leveling LU7: Perform Profile Leveling on a strip LU8: Prepare Contour Map	27	123	150

Module 1: Maintain safety at Workplace

Objective of the module: This competency standard covers the skills and knowledge required to maintain safe work condition

Duration: 40 hours **Theory:** 10 hours **Practical:** 30 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU 1 Maintain safe work condition at site	The trainee will be able to: 1. Recognize the safety signs and symbols 2. Identify potential hazards at work site 3. Erect barricades hoardings, signage's in the hazardous areas 4. Identify the risk of slip, trip and fall at work place 5. Perform fall protection measures as per job requirements	• Describe the safety signs at work place • Describe the types of hazards and its control measures at work place • Explain the fall protection measures • Describe unsafe act and unsafe conditions • Housekeeping at workplace • Types of hazardous materials and relevant safety procedures Activity: • Visit the work site and identify the work hazards and apply control measures • Practice to wear full body harness as per site conditions. • Sort and label hazardous chemicals at work site	Total 8 hrs Theory: 2 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system • PPEs kit	• Class Room • Simulated environment

	6. Maintain housekeeping at the workplace 7. Label and store chemicals as per Material Safety Data Sheet (MSDS)				
LU 2 Perform fire fighting	The trainee will be able to: 1. Identify source of fire. 2. Identify classes of fire 3. Raise fire alarms 4. Select suitable fire extinguishers 5. Check expiry of fire extinguisher 6. Check wind direction 7. Locate emergency exits 8. Perform PASS (Pull, aim, squeeze and	• Describe the fire triangle • State principles of fire fighting • Describe the source of fire • Explain classes of fire • Explain firefighting techniques • State types of fire extinguisher Activity: • Perform mock exercise of fire fighting. • Participate in emergency response drill.	Total 12 hrs Theory: 3 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	• Class Room • Simulated environment

	sweep) on fire extinguisher				
LU 3 Carry out basic first aid	The trainee will be able to: 1. Follow COVID-19 SOP's 2. Identify basic elements for first aid kit 3. Maintain a fully stacked first aid kit 4. Check expiry date of medicines 5. Perform mock first aid treatment for minor injuries	• Describe the ABC of first aid • Describe the first aid procedure for open wound • Describe components of first aid Activity: • Demonstrate mock exercise of first aid treatment for minor cut.	Total 12 hrs Theory: 3 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • First aid kit Non Consumable • White board • Multimedia • Internet • Computer system	• Class Room • Simulated environment
LU 4 Perform Basic electrical work safely at workplace	The trainee will be able to: 1. Check the connectivity of earthing with power equipment 2. Check leads and cable for any visual damage before use	• Describe the electric hazards • Describe cause of electric shocks • Describe protective measures against the electric hazards Activity:	Total 8 hrs Theory: 2 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Insulation tape • Power cables	• Class Room • Simulated environment

	3. Tag damaged lead, cable and connection points and report to the supervisor	• Practice to check power cables for any visual damage. • Practice to insulate joints/damages in power cables with insulation tape.		Non Consumable • White board • Multimedia • Internet • Computer system • PPEs kit	
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Module 2: Process Consumer Complaint

Objective of the module: The aim of this module to get knowledge, skills and understanding to process consumer complaint.

Duration: 40 hours **Theory:** 10 hours **Practical:** 30 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Respond to consumer complaint	The trainee will be able to: 1. Process the complaint as per organization SOP. 2. Maintain complaint register	• Knowledge of Organizational policies and procedures for dealing complaints • Knowledge of Importance of consumer complaints • Knowledge of Importance of good communication • Knowledge of Individual role in processing customer complaint Activity: • Practice to register a mockup complaint and update the record	Total: 20hrs Theory: 5hrs Practical: 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Pen • Complaint register Non-Consumable • White board • Multimedia • Internet • Computer system	• Class Room/Lab

LU2: Refer complaint	The trainee will be able to: 1. Identify the complaint to be referred 2. Forward all the documents and investigation report 3. Follow the reported complaint 4. Provide feedback to the complainant	• Knowledge of Methods of investigation • Knowledge of Complaint register • Knowledge of Customer Complaint Steps • Knowledge of Importance of feedback Activity: • Practice to identify the mockup complaint and refer it to the concern authority	Total: 20hrs Theory: 5hrs Practical: 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Complaint register Non Consumable • White board • Multimedia • Internet • Computer system	• Class Room/Lab
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Module 3: Perform Basic Plumbing

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform basic plumbing

Duration:110hours

Theory: 20hours

Practical: 90 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Identify plumbing tools and equipment	The trainee will be able to: 1. Draw required layout drawing 2. Identify plumbing tools & equipment	• Knowledge of Plumbing • Types of plumbing tools (pipe wrench, spanner, screw drivers, pipe cutters etc.) • Types of plumbing equipment (Threading die, Hack Saw, Bench Vice, Leg Vice and reamer) • Water supply system symbols • Tool calibration Activity: • Practice to draw a sanitation layout of a bathroom and a kitchen • Identify plumbing tools for a specific job.	Total: 26hrs Theory: 5hrs Practical: 21hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Pen • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Pipe wrench • Spanner • Screw driver • PPRC Pipe cutters • G.I pipe cutter	Class Room / Plumbing Lab

				• Threading dies • Hack Saw • Bench Vice • Leg Vice • Reamers	
LU2: Perform pipe cutting, threading & reaming	The trainee will be able to: 1. Perform pipe cutting 2. Perform pipe threading 3. Perform pipe reaming	• Procedures for using plumbing tools. • Procedure for G.I pipe cutting, threading, reaming • Procedure for PPRC pipe cutting. • Types of dies for threading Activity: • Practice of cutting a specific length of GI pipe by using proper tools. • Perform threading and reaming of GI pipe by using proper tools. • Practice of cutting a specific length of PPRC pipe by using proper cutter.	Total: 26hrs Theory: 5hrs Practical: 21hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia • Pipe wrench • Spanner • Screw driver • PPRC Pipe cutters • G.I pipe cutter • Threading dies • Hack Saw • Bench Vice • Leg Vice • Reamers	• Class Room / Plumbing Lab

LU3: Join PPRC pipes & fittings	The trainee will be able to: 1. Select required pipes and fitting 2. Join PPRC pipes using heating tool 3. Allow the joint to cool down 4. Take pipe leakage test	• Procedure for PPRC pipe joining • Different pipe joints • Types of PPRC pipes and fittings • Hot and cold-water line • Safety valves • Pipe water leakage test of PPRC pipes Activity: • Practice of joining PPRC pipes with proper fitting as per sanitation drawing. • Practice to perform PPRC pipe leakage test.	Total:29hrs Theory:5hrs Practical:24hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Pipe wrench • Spanner • Screw driver • PPRC Pipe cutters • fusion tools for PPRC • Hack Saw • Bench Vice • Leg Vice	• Class Room / Plumbing Lab
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LU4: Join G.I pipes and fittings	The trainee will be able to: 1. Select required pipes and fitting 2. Select required die 3. Perform cutting and threading of pipe 4. Select required socket 5. Join G.I pipe with socket 6. Take pipe leakage test	• Types of G.I pipes and fitting • Coupling of G.I pipes • Procedure to join G.I pipe • Safety valves • Pipe water leakage test of G.I pipes Activity: • Practice of joining G.I pipes with proper fitting as per sanitation drawing. • Practice to perform G.I pipe leakage test	Total:29hrs Theory:5hrs Practical:24hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Pipe wrench • Spanner • Screw driver • G.I pipe cutter • Threading dies • Hack Saw • Bench Vice • Leg Vice • Reamers	Class Room / Plumbing Lab
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Module 4: Produce Civil Engineering Drawings

Objective of the module: The aim of this module to get knowledge, skills and understanding to produce civil engineering drawings

Duration: 100 hours

Theory: 16hours

Practical: 84 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare detailed drawings	The trainee will be able to: 1. Draw required plan with details 2. Draw required front and side elevation 3. Draw required site plan, layout plan 4. Draw required cross section	• Knowledge of Types of roads and their components • Knowledge of Types of Buildings and their components • Knowledge of Types of streets and their components • Knowledge of Types of drains and their components • Knowledge of Working drawings • Knowledge of Model structures • Knowledge of Submission drawings • Knowledge of Detail drawings (cross section, working plan, elevation etc.) • Knowledge of Types of Elevation • Knowledge of Types of plans (site plan, layout plan etc.) • Knowledge of Types of utility services • Knowledge of Service structures • Knowledge of Cross sections of civil structures (Buildings, roads etc.)	Total: 47hrs Theory: 8hrs Practical: 39hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • Drawing sheets • Drawing pen • Masking tape • Different drawing pencils • Scale Non Consumable • White board • Multimedia • Internet	Class Room/ Drawing Hall

		• Knowledge of engineering drawing signs and symbol Activity: • Practice to draw layout plan of a single-story residential building (600 sqft) • Practice to draw front elevation of a single-story residential building (600 sqft) • Practice to draw cross section of a single-story residential building (600 sqft) • Practice to draw cross section of two-lane flexible road. • Determination of Qibla direction.		• Computer system • Drawing board • Drawing instruments	
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LU2. Prepare layout plan for services	The trainee will be able to: 1. Draw layout plan for water supply and sanitation for public building 2. Draw the details of services structures 3. Draw cross section of streets	• Knowledge of Types of utility services • Knowledge of water supply drawings and their symbols • Knowledge of sanitation drawings and their symbols • Knowledge of electrical drawings and their symbols • Knowledge of internet drawings and their symbols • Knowledge of Service structures • Knowledge of schedule of openings Activity: • Practice to prepare a layout plan for electrical services for a single story residential building (600sqft). • Prepare a schedule of openings. • Practice to prepare a layout plan for water supply system for a housing society of minimum 100 houses.	Total:53hrs Theory:8hrs Practical:45hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • Drawing sheets • Drawing pen • Masking tape • Different drawing pencils • Scale Non Consumable • White board • Multimedia • Internet • Computer system • Drawing board	• Class Room/ Drawing Hall
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				• Drawing instruments	
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Module 5: Prepare Rough Cost Estimation

Objective of the module: The aim of this module to get knowledge, skills and understanding to prepare rough cost estimation

Duration: 80 hours

Theory: 17 hours

Practical: 63 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare rough cost estimate by unit rate method.	The trainee will be able to: - Interpret line plan. - Divide plan into small units - Calculate number of units - Calculate unit rate - Compile results of estimate	- Rough cost estimation - Construction work units - Line plan - Types of estimation (unit area method) - Methods of rough cost estimation - Specifications of building classes and roads - Types of construction works Activity: - Prepare an approximate estimate or rough cost estimate of a hospital building for 50 beds. The cost of construction for each bed is Rs. 60,000. Determine total cost of hospital building. - Prepare an approximate estimate or rough cost estimate of a hotel building for 150 rooms. The cost of construction for each room is Rs. 80,000. Determine total cost of hotel building.	Total: 11 Theory: 2 hrs Practical: 9 Hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - White board marker Non Consumable - White board - Multimedia - Internet - Computer system	Class Room

LU2: Prepare Rough Cost estimate by plinth area method.	The trainee will be able to: • Calculate covered area of building • Calculate cost per square unit • Calculate cost estimate	• Types of estimation (plinth area method) Activity: • A person is to construct a building of plinth area equal to 120 m² on a plot in Lahore at a cost of Rs. 600,000. Height of the building from the ground level to the top of roof is 3.2 m and a parapet wall of height 800 mm is constructed on the terrace. Determine the cost of construction of a similar type of building of plinth area 150 m² in the same locality based on plinth area rate and cubic content/volume rate. • Prepare an approximate estimate of building project with total plinth area of all building is 800 square meter and following data: i. Plinth area rate Rs. 4500 per square meter. ii. Cost of water supply@7 ½ % of cost of building. iii. Cost of sanitary and electrical installation each @ 7 ½ % of cost of building iv. Cost of architectural features @ 1% of building cost v. Cost of roads and lawns @ 5% of building cost.	Total: 11 Hrs Theory: 2 hrs Practical: 9 Hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	Class Room / Plant Site
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		vi. Cost of contingencies @ 4% of building cost. Determine the total cost of building project.			
LU3: Prepare Rough cost Estimate of pipe lines	The trainee will be able to: - Measure lengths of each diameter pipe. - Prepare analysis of rate for pipe line. - Calculate amount of pipe line.	- Analysis of rate - Procedure for abstract of cost - Procedures for quantity calculations Activity: - Prepare quantity estimate for 300-ft long sewer line. Concrete pipe length is 6 ft. Cost of pipe is Rs. 890 per foot. Assume the ground as level.	Total: 11 Hrs Theory: 2 hrs Practical: 9 Hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners Non Consumable - White board - Multimedia - Internet - Computer system - PLC	Class Room / Plant Site
LU4: Prepare Rough cost Estimate of water supply scheme	The trainee will be able to:	- Methods of estimating Population - Methods of calculating water demand - Components of water supply scheme and its appurtenance - Types of hydraulic data - Components of water tank	Total: 17 Hrs Theory: 5 hrs Practical: 12 Hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners Non Consumable	Class Room / Plant Site

	- Collect the population and hydraulic data. - Calculate the demand of water - Calculate capacity of tank in gallons. - Calculate length of the supply line and appurtenance - Calculate cost of construction of tank.	Activity: - Calculate the size of a water tank for a family of four persons. Usage of water is 135 liters per person per day. - Preparation of rough cost estimate of water supply scheme 1000 ft length comprising of rising main and 5 branches including analysis of rates for works and preparation of hydraulic statement.		- White board - Multimedia - Internet - Computer system - PLC	
LU5: Prepare Rough cost Estimate of sewer scheme	The trainee will be able to: - Measure lengths of each diameter pipe. - Prepare analysis of rate for sewer line. - Prepare the analysis of rate for manhole - Calculate amount of sewer line.	- Types of hydraulic data - Components of sewerage scheme - Components of septic tanks Activity: - Prepare rough cost estimate of sewerage scheme comprising of 1000 ft sewer line, min 10 manholes and 5 branches of min 2 sizes of sewer including analysis of rates for works and preparation of hydraulic statement. - Complete estimate of Septic tank and Soakage pit for 25 users.	Total: 15 Hrs Theory: 3 hrs Practical: 12Hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners Non Consumable - White board - Multimedia - Internet - Computer system - PLC	Class Room / Plant Site

LU6: Prepare estimate of urban road/street	The trainee will be able to: • Calculate area of road site. • Calculate the volume of earthworks • Calculate volume of sub base and base course of road • Calculate area of surfacing • Measure items of road marking and sign boards. • Prepare abstract of cost.	• Terms used in excavation of earth. • Methods for quantity calculations of earthwork. • Parts of road structure and their specifications • Cross section and L-section of roads and street • Procedure for abstract of cost • Units of measurements (FPS, MKS, SI) • Unit conversions Activity: • Calculate the quantity of earth work for a portion of a road on a uniform ground with the following data by average (mean) depth, average (mean) sectional area methods and by Prismoid formula. Length of road = L = 200m Height of bank on one end = 2m Height of bank on other end = 3m Formation width = 10m Side slope in filling = 2:1 • Workout the quality of stone metal required for 2Km length for wearing coat of a 4m wide road. The thickness of the metal road required is 12cm loose. • Calculate the quality of earthwork for the construction of an approach road Length = 1Km Width of formation = 10 m Height of embankment = 60 cm Side slope = 1:2	Total: 15 Hrs Theory: 3 hrs Practical: 12 Hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system • PLC	Class Room / Plant Site
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		An approach road 2Km long is to be constructed. Work out the quantity of materials required i.e. stone metal and bricks. Data is given below. Length = 2 Km Metalled width = 3.60m Soiling of bricks =10cm Wearing coat of stone metal = 12 cm			
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Module 6: Collect and Organize Field Survey Data

Objective of the module: The aim of this module to get knowledge, skills and understanding to collect and organize field survey data

Duration: 80 hours

Theory: 20 hours

Practical: 60 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare tools for direct data collection	The trainee will be able to: 1. Identify expected data outcomes 2. Select the population 3. Select data collection method 4. Prepare the survey vehicle/questionnaire 5. Identify sample size 6. Test vehicle/questionnaire 7. Correct vehicle/ questionnaire if required	• Survey data • Survey vehicle • Different between census and survey data • Primary and secondary sources of data • Advantages and disadvantages of different sources of data • Sampling and population methodologies • Data collection tools and their types Activity: • Practice of preparing a check list for traffic volume/flow • Practice of preparing a questionnaire for finding out mode of transport of a given area	Total: 20 Hrs Theory: 5 Hrs Practical: 15 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Survey form • Non Consumable • White board • Multimedia • Internet • Computer system • Calculator • Printer • Scanner	Class Room / Lab

LU2: Conduct data collection using direct collection tools	1. Select target population 2. Collect required data using tools	• Knowledge of selection of target population • Knowledge of direct collection tools • Knowledge of different data collection methodologies • Knowledge of limitations of secondary data • Knowledge of accuracy of survey data • Knowledge of Digital data logging • Knowledge of Data segregation methods Activity: • Practice of conducting a survey for mode of transportation of a given area and prepare record.	Total: 20 Hrs Theory: 5Hrs Practical: 15 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Survey form Non Consumable • White board • Multimedia • Internet • Computer system • Calculator • Printer • Scanner	Class Room / Site
LU3: Conduct data collection using existing sources	The trainee will be able to: 1. Identify resources for information 2. Select the required source 3. Collect the data	• Knowledge of collection of existing sources • Knowledge of different existing data collection methodologies • Knowledge of limitations of existing data • Knowledge of accuracy of existing data • Knowledge of Digital existing data logging	Total: 20 Hrs Theory: 5 Hrs Practical: 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Survey form Non Consumable	Class Room / Site

		Activity: Practice of identifying source of existing information and collect data for types of vehicles used in specific area		- White board - Multimedia - Internet - Computer system - Calculator - Printer - Scanner	
LU4 Organize data	The trainee will be able to: - Segregate collected data - Record the data in required format - Record the data outcome	- Knowledge of Digital data logging - Knowledge of recording outcome data - Knowledge of Data segregation methods Activity: - Practice of segregating different types of vehicles from collected data used in specific area and record the outcome data. - Practice to prepare a report of collected data.	Total: 20 Hrs Theory: 5 Hrs Practical: 15 hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - Survey form Non Consumable - White board - Multimedia - Internet - Computer system - Calculator - Printer - Scanner	Class Room / Lab

Module 7: Perform Basic Survey and leveling

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform bench works.

Duration: 150 hours

Theory: 27 hours

Practical: 123 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform Linear measurements	The trainee will be able to: 1. Select the measuring instruments 2. Measure distance on horizontal surface 3. Measure distance on sloppy surface 4. Perform corrections in linear measurements 5. Take offsets and record data	• Define basic terminologies of surveying: objects, uses, classification, general principle, ranging, testing of measuring instruments • Knowledge about methods of linear measurements on horizontal and sloppy surface along with the offsets of nearby objects. • Knowledge about entries in field book. • Knowledge of errors, mistakes and obstacles in measurement • Knowledge of linear measurement corrections • Procedure to measure horizontal and sloppy distance Activity: • Extend the line by direct ranging. • Measure the distance between two points A and B half kilometer apart, take offsets of the objects nearby. • The distance between two points, measured with a 20 m chain, was	Total: 18 hrs Theory: 3 hrs Practical: 15 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non Consumable • Tape Measure • Sling • White board • Multimedia • Internet • Computer system	• Class Room

		recorded as 327. It was afterwards found that the chain was 3 cm too long. What was the true distance between the points? • Enter the field book according to the following field notes: a. Chainage of line AB is 95.5 m b. Offsets to the pond on the left of chain line are as follows: Chainage:10,15,20,25,30m Offsets:16,12,10,14,20m c. The offsets to the river at the right of chain are: Chainage:5,25,40,80m Offsets:13,17,19,19.5m			
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LU2: Perform Demarcation of land by conventional method	The trainee will be able to: 1. Interpret land map (shajrah) 2. Trace the reference burji 3. Mark the khasra number 4. Demark the required property	• Knowledge of conventional land record system • Terminologies used in conventional land record system • Procedure of transfer of land • Land accusation process • Property demarcation procedure Activity: • Take measurements of your institute and prepare a land map. • Perform demarcation of the land map given by the assessor.	Total: 18 hrs Theory: 3 hrs Practical: 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • Tape Measure • White board • Multimedia • Internet • Computer system	• Class Room /
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LU3: Carryout plane table survey	The trainee will be able to: 1. Select the tools and instruments 2. Perform reconnaissance survey of the area 3. Select the required method for plane tabling 4. Perform centering and orientation of plane table 5. Carry out plane table survey by radiation 6. Carry out plane table survey by intersection 7. Draw conventional symbols of object 8. Draw the plan	• Knowledge of principle of plane table • Accessories of plane table • Procedure of orientation of plane table • Knowledge about different geometrical area formulas • Procedure of plane table survey by radiation and intersection • Types of conventional symbols and their importance • Knowledge about base and check line in traverse Method of calculating area using plane table survey Activity: • Practice of performing temporary adjustment of plane table • Plot a given area having inaccessible points assigned by trainer by intersection method of plane table survey. Enter all measurements in the field book. • Plot a given area assigned by trainer by radiation method of plane table survey. Enter all measurements in the field book.	Total: 18 hrs Theory: 3hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • White board • Multimedia • Internet • Computer system	• Class Room /
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LU4: Perform Traversing by Compass	1. Select the traverse station 2. Set compass on a traverse station 3. Read bearings of point 4. Record the data 5. Perform adjustments of data 6. Draw the traverse	• Define basic terminologies of traversing: introduction, purpose, principle, types, • Methods of traversing • Explain Compass, types, its parts and measure bearings • Procedure of temporary adjustment of prismatic compass • Bearing: fore-bearing and back-bearing and its designation • Method of plotting of traverse by adjusting closing error • Knowledge about area calculation from traverse • Types of errors Activity: • Practice to set up compass over an assumed station and take bearing of any two points. • Take bearings and linear measurements of an area of closed traverse ABCDEFA and plot the traverse by adjusting the closing error, if any. • The bearings of the sides of a triangle are as follows. Compute the interior angles: AB = 60°, BC = 130°, CA = 270°	Total: 18 hrs Theory: 3 hr Practical: 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • White board • Multimedia • Internet Computer system	•
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LU5: Perform Simple Leveling	1. Select the levelling equipment 2. Perform temporary adjustment of level 3. Read ranging staff on given bench Mark 4. Record the staff readings 5. Calculate reduced levels 6. Apply arithmetic checks	• Define technical terms level line, level surface, datum, datum line, horizontal plane, vertical plane, horizontal line, vertical line, level line, line of collimation, axis of telescope, bubble tube axes, parallax, back-sight, foresight, intermediate sight, change point, station point • Purpose of leveling • Explain the tools and equipment used in leveling • Knowledge about adjustment of a level • Knowledge about benchmark and its types • Define simple leveling • Procedure of simple leveling • Knowledge of reduced levels • Procedure to calculate reduced levels • Knowledge of arithmetic checks for leveling Activity: • Practice of reading different types of staves. • Practice of temporary adjustment of level at a station and calculate difference of level between two points AB by take reading. • Practice of determining reduced	Total: 18 hrs Theory: 3 hrs Practical: 15 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • White board • Multimedia • Internet Computer system	•
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		levels (RLs) of various points by different methods. - Following consecutive readings were taken by dumpy level, parallel to chain line at 15 m interval. First reading was taken at a chainage 165m where RL is 90.085. Instrument was changed after 4th and 9th reading. Find RL of all points by collimation system and rise and fall method: 3.150, 2.245, 1.125, 0.860, 3.125, 2.760, 1.835, 1.470, 1.965, 2.390 and 3.035. - Shift the given bench mark to an assigned point by precise leveling			
LU6: Carry out Fly Leveling	- Select the leveling equipment - Perform temporary adjustment of level near permanent benchmark - Read backsight on given bench mark using staff - Record the staff readings	- Define fly leveling - Procedure of fly leveling - Precautions in fly leveling Activity: - In running fly levels from a bench mark(BM) of reduced level (RL) 250.00, the following readings (in m) were obtained: Backsight:1.315, 2.035, 1.980, 2.625	Total: 18 hrs Theory: 3 hrs Practical: 15hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - Log Book - Summary Sheet - Cleaning rag	

	5. Calculate reduced levels 6. Apply arithmetic checks 7. Check and adjust the closing error	Foresight:1.150, 3.450, 2.255 From the last position of the instrument, five pegs from 20m interval are to be set on a uniform rising gradient of 1:40. The first peg is to have a RL of 247.245m. work out staff readings required for setting the tops of the pegs on the given gradient. Find out the difference of elevation between any two given points by fly leveling and find RLs by Height of collimation and rise and fall method.		- Wire brush Non-Consumable - White board - Multimedia - Internet Computer system	
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LU7: Perform Profile Leveling on a strip	The trainee will be able to: 1. Select the required tools and equipment 2. De-mark the centre line and cross sections at appropriate distance 3. Perform temporary adjustment of level near permanent benchmark 4. Draw the table for entering the staff reading 5. Take staff readings on centre line and cross section points 6. Calculate reduced levels 7. Apply arithmetic checks 8. Draw the profile 9. Draw the cross sections	10. Define profile leveling 11. Procedure of profile leveling 12. Precautions in profile leveling Activity: • Take long section and cross section of ½ kilometer long route, its plotting, marking alignment and gradient and calculate earthwork.	Total: 18 hrs Theory: 3 hrs Practical: 15Hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • White board • Multimedia • Internet • Computer system	• Class Room / Crush Plant Site
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LU8: Prepare Contour Map	The trainee will be able to: 1. Select the required tools and equipment 2. Mark the grid points on the required site 3. Perform temporary adjustment of level near permanent benchmark 4. Draw the table for entering the staff reading 5. Take staff readings on grid points 6. Calculate reduced levels 7. Apply arithmetic checks 8. Draw grid plan on graph paper and mark R.L of each grid points 9. Interpolate the contours at specified contour interval	• Basic terminologies related to contouring: definition, objectives, uses, characteristics, contour gradients. • Methods of contouring • Interpolation of contouring • Field location of grade contour Activity: • Practices contouring of small area assigned by trainer by square method and prepare a contour map. • Practices contouring of small area assigned by trainer by radial method and prepare a contour map.	Total: 24 hrs Theory: 6 hrs Practical: 18 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Log Book • Summary Sheet • Cleaning rag • Wire brush Non-Consumable • White board • Multimedia • Internet • Computer system	• Class Room / Crush Plant Site
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General assessment guidance for *Urban Area Planning and Management*

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 Urban Area Assistant Supervisor include:

- Work performances, for example perform basic communication, maintain personal health, hygiene and safety and perform basic computer operations
- Demonstrations, for example Identifying plumbing fixtures and accessories
- Direct questioning, where the assessor would ask the student how to perform personal safety at work place, how they can communicate work place policy and procedures, how they can create survey and how they can perform survey
- Paper-based tests, such as multiple choice or short answer questions on communication at work place policy and procedures, Survey and plumbing

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

Examples for indirect assessment of Urban Area Assistant Supervisor include:

- Work products, such as preparing and handling documents, perform some procedures of Plumbing

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. For example, if documentation or identifying Electrical Circuits and Measurements are to be assessed and certificated, the assessment should involve performance criteria that are directly related to that documentation activity. An interview about the identifying Electrical Circuits and Measurements would not meet the performance criteria.

Reliability means that the assessment is consistent and reproducible. For example, if the work performance of preparing documents in words has been assessed, another assessor (e.g. the future employer) should be able to see the same work performance and witness the same level of achievement.

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

Assessment strategy for *Urban Area Assistant Supervisor*

This curriculum consists of 7 modules:

- **Module 1:** Maintain Safety at Workplace
- **Module 2:** Process Consumer Complaint
- **Module 3:** Perform Basic Plumbing
- **Module 4:** Produce Civil Engineering Drawings
- **Module 5:** Prepare Rough cost estimation
- **Module 6:** Collect and Organize Field Survey data
- **Module 7:** Perform Basic Survey and Leveling

Sessional assessment

The sessional assessment for all modules shall be 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 one hour 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 be in two parts: theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification.

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 25 students shall therefore require assessments to be carried out over a four-day period. For a group of only 10 to 15 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 programme for each group of five students. Training providers must agree the content for practical assessments in advance.

LIST OF TOOLS, MACHINERY and EQUIPMENT

Sr#	Description	Quantity
1.	Safety Helmets	26
2.	Safety Blankets	1
3.	Fire Extinguishers	1
4.	Board of Safety instructions.	1
5.	Chain Hoist	1
6.	Threading die	1
7.	Hack saw	10
8.	Bench vice	10
9.	Pencil	10
10.	Eraser	10
11.	Sharpener	10
12.	Calculator	10
13.	Set Square	5
14.	Measuring Scale	5
15.	Drawing sheet	5
16.	Measuring tape	5
17.	Field Book	5

18.	Leg Vice	5
19.	Plumbing wrench	5
20.	Pipe heating tool	5
21.	PPRC pipes	5
22.	G.I pipes	5
23.	Reamer	10
24.	Plumbing spanners	5
25.	Plumbing pliers	2
26.	Screw driver set	5
27.	Compass	5
28.	Levelling staff	5 each
29.	Ranging rod	2
30.	Cross staff	5
31.	PPEs	5
32.	Tripod	5
33.	Pegs	5
34.	Chalk	5
35.	Thermometer	5
36.	Ball peen hammer	5
37.	Simple alidade	5
38.	Plane table with clamps	5

39.	U frame	5
40.	Spirit level	5 each
41.	Arrows	10
42.	Survey Chain	25
43.	Scotch tape	10
44.	Pipe cutter	10
45.	Computer	5
46.	Internet	5
47.	Drawing board	25
48.	White board	1
49.	multimedia	1

LIST OF CONSUMABLE SUPPLIES

Sr no	Material	Quantity
1.	Note book	25
2.	Pencil	25
3.	White sheets	25
4.	Eraser	25
5.	Sharpener	25
6.	Pen	25

7.	Clutch pencils	25
8.	Sticky Notes	25
9.	Card sheets	100
10.	Cleaning brush	25
11.	Cotton rags	1KG
12.	PPE's	25
13.	Lubricants	In Litters
14.	Drawing Board	25
15.	Drawing Sheets	25
16.	Note book	25
17.	Complaint register	25
18.	Threads	25
19.	White board marker	25
20.	Pipe wrench	10
21.	Spanner	10
22.	PPRC pipe cutter	10
23.	Different drawing pencils	25
24.	Drawing pen	25
25.	Masking tape	25
26.	PPES	25
27.	Fusion tools for pprc	10

28.	Drawing instrument	10
29.	Software	1
30.	Survey form	25
31.	printer	1
32.	scanner	1

Credit values

The credit value of the National Certificate Level 2 in Dies & Digging Operation Supervisor 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
A. Maintain Safety at Workplace	40	04
B. Process Consumer Complaint	40	04
C. Perform Basic Plumbing	110	11
D. Produce Civil Engineering Drawings	100	10

Competency Standard	Estimate of hours	Credit
E. Prepare Rough Cost Estimation	80	08
F. Collect and Organize Field Survey Data	80	08
G. Perform Basic Survey and leveling	150	15

Members of the Curriculum Development Committee

The following members participated in the qualification development of these qualifications:

Sr. No.	Name	Designation	Organization
1.	Muhammad Abdul Moeez	DACUM Facilitator/ Structural Engineer	RMCE Lahore
2.	Mr. Shahzad Ahmad	Coordinator	Deputy Director NAVTTC, Islamabad
3.	Engr. Azhar Iqbal Shad	Retired Principal	GCT, Raiwand road Lahore
4.	Mr. Muhammad Usman Khan	Building Inspector	Kasur
5.	Mr. Sikandar Hayat	Instructor	GCT, Raiwand road Lahore
6.	Mr. Nadeem Zaigham	Sr. Instructor	GCT, Raiwind, Lahore
7.	Ms. Nigar Majeed	QCM, Human Development Organization	Faisalabad
8.	Engr. Rehan Younis	AD	FWO, Rawalpindi
9.	Mr. Arsalan Hameed	AD	Planning Development Lahore
10.	Mr. Tahir Mahmood	Senior Instructor	GTTI Mughalpura, Lahore
11.	Engr. Abdul Basit Mansoor	AEE	PWD Sialkot
12.	Mr. Usama Ahmed Sheikh	Track and Infrastructure Engineer	Orange Line Lahore

Members of the Curriculum Review Committee

The following members participated in the qualification validation of these qualifications:

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4.	Mr. Mudassir Mujeeb	DACUM Expert	Jampur
5.	Ms. Anum Fayyaz	Instructor, Architecture Department	GCT ,Railway road Lahore
6.	Ms. Hira Ishtiaq	Community Designer	AIMS Engineering Lahore
7.	Mr. Mohsin Ali Sheikh	AM	Engro fertilizers, Gotki
8.	Mr. Tahir Mahmood	Senior Instructor	GTTI Mughalpura, Lahore
9.	Engr. Abdul Basit Mansoor	AEE	PWD Sialkot
10.	Mr. Abdul Shakoor	Site Supervisor	RYK
11.	Engr. Rehan Younis	AD	FWO Rawalpindi
12.	Mr. Muhammad Umer	Civil Contractor	Faisalabad
13.	Mr. Arsalan Hameed	AD	Planning Development, Lahore

14.	Engr. Muhammad Ibrar	Manager Site	Bahawalpur
15.	Syed Zafar Ayub Hussain Shah	Project Coordinator ZKB	Peshawar
16.	Mr. Faran Asif	Msc. Geotechnical Engineering	NUST Islamabad