

Curriculum

For

“Urban Area Planning and Management”

(Level -4)

18th to 22th April 2022



**National Vocational & Technical
Training Commission**

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Introduction

Definition/ Description of the training programme for Urban Area Supervisor

There is an increasing demand of the Urban Area 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 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

- Establish and Maintain the Occupational Health and Safety System
- Perform Advance Communication
- Perform Environmental Management
- Perform 2D and 3D drawings using CAD Software
- Plan and Organize work
- Perform Setting out of Urban Project
- Perform Advance Survey
- Construct and Maintain water and waste water scheme
- Prepare Detailed Estimate
- Prepare Zone plan
- Perform Basic Green Skills for Urban Area Planning and Management

Possible available job opportunities available immediately and later in the future

- Urban Area Supervisor
- Town Surveyor
- Environmental Engineering Assistant

Trainee entry level

Matric or Equivalent (with English, Urdu, Numeracy, reading and writing skills)

Minimum qualification of trainer

Teaching staff should have bachelor's degree in Civil /Architecture Engineering or Technology with at least one years' experience in Construction Industry. Other formal certification in the surveying, zone planning and water supply scheme having grip on the engineering drawings and computer skills

OR

Teacher should have Level-5 / DAE in Civil/Architecture with at least five years' experience in construction industry. Other formal certification in surveying, zone planning and water supply scheme having grip on the AutoCAD

Recommended trainer: trainee ratio

The recommended maximum trainer: trainee ratio for this program 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 11 modules. The recommended delivery time is 1200 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	Establish and Maintain the Occupational Health and Safety System	4	1.8	18	4.2	42	6.0	60
2	Perform Advance Communication	4	1.9	19	5.1	51	7.0	70
3	Perform Environmental Management	4	2.5	25	7.5	75	10	100
4	Perform 2D and 3D drawings using CAD Software	4	2.0	20	18	180	20	200
5	Plan and Organise work	4	3.0	30	3.0	30	6.0	60
6	Perform Setting out of Urban Project	4	2.0	20	9.0	90	11	110
7	Perform Advance Survey	4	2.4	24	15.6	156	18	180
8	Construct and Maintain water and waste water scheme	4	2.9	29	5.1	51	8.0	80
9	Prepare Detailed Estimate	4	2.6	26	17.4	174	20	200
10	Prepare Zone Plan	4	2.0	20	9.0	90	11	110
11	Perform Basic Green Skills for Urban Area Planning and Management	4	0.9	9	2.1	21	3.0	30
Total			24	240	96	960	120	1200

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: Establish and Maintain the Occupational Health and Safety System 60 Hours	Module 4: Perform 2D and 3D drawings using CAD Software 200 Hours	Module 10: Prepare Zone Plan 110 Hours
Module 2: Perform Advance Communication 70 Hours		Module 9: Prepare Detailed Estimate 200 Hours
Module 5: Plan and Organise work 60 Hours	Module 3: Perform Environmental Management 100 Hours	Module 8: Construct and Maintain water and waste water scheme 80 Hours
Module 7: Perform Advance Survey 180 Hours	Module 6: Perform Setting out of Urban Project 110 Hours	Module 11: Perform Basic Green Skills for Urban Area Planning and Management 30 Hours

Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 1: Establish and Maintain the Occupational Health and Safety System Aim: After successful completion of this module, the trainee is competent in maintaining personal Health, Hygiene and safety	LU1: Examine hazards at workplace LU2: Follow emergency response protocol/procedure LU3: Carry out first aid LU4: Report and investigate the accident at site LU5: Maintain ergonomics condition at workplace	18	42	60

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 2: Perform Advance Communication Aim: After successful completion of this module, the trainee is competent in performing advance communication skills	LU1: Develop workplace documentation skills LU2: Manage meeting at workplace	19	51	70
Module 3: Perform Environmental Management Aim: After successful completion of this module, the trainee is competent in performing Environmental Management	LU1: Collect sample of water and wastewater LU2: Find out Water Pollution LU3: Evaluate Air Pollution LU4: Measure Noise Pollution	25	75	100

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 4: Perform 2D & 3D Engineering Drawings using CAD software Aim: After successful completion of this module, the trainee is competent in Performing 2D & 3D Engineering Drawings using CAD software	LU1: Draw 2D shapes LU2: Prepare final sets of 2D drawings LU3: Develop 3D Objects LU4: Manipulate 3D objects using 3D Editing Tools LU5: Render 3D Model	20	180	200
Module 5: Plan and Organize work Aim: After successful completion of this module, the trainee is competent in planning and organizing work	LU1: Interpret drawing and job order. LU2: Estimate manpower requirement. LU3: Manage Facilities and utilities LU4: Manage Sub ordinates	30	30	60

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 6: Perform Setting out of Urban Project Aim: After successful completion of this module, the trainee is competent in Performing setting out of urban project	LU1: Prepare for works LU2: Carryout layout for building LU3: Carryout layout for sewer pipeline LU4: Carryout layout for road	20	90	110
Module 7: Perform Advance Survey Aim: After successful completion of this module, the trainee is competent in performing advance survey	LU1: Measure distance by total station LU2: Measure angles by total station LU3: Measure area and perimeter of traverse by total station LU4: Find out occupied point coordinates LU5: Prepare topographic plan	24	156	180

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 8: Construct and Maintain water and waste water scheme Aim: After successful completion of this module, the trainee is competent in constructing and maintaining water and waste water scheme	LU1: Perform preparatory activities LU2: Construct and install pipelines LU3: Finalize work LU4: Conduct maintenance and repairs	29	51	80
Module 09: Prepare Detailed Estimate Aim: After successful completion of this module, the trainee is competent in preparing detailed estimate	LU1: Work out quantities for building LU2: Prepare Abstract of Cost LU3: Prepare road estimate LU4: Prepare estimate for special repair LU5: Prepare Annual repair estimate of building/road LU6: Prepare estimate of water supply scheme LU7: Prepare Rate analysis of building item of works LU8: Prepare material statement	26	174	200

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 10: Prepare Zone plan Aim: After successful completion of this module, the trainee is competent in preparing zone plan	LU1: Prepare location plan LU2: Prepare zoning map with percentage plan	20	90	110

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 11: Perform Basic Green Skills for Urban Area Planning and Management Aim: After successful completion of this module, the trainee is competent in performing basic green skills for urban area planning and management	LU1: Apply green skills in construction sector LU2: Develop green zones in urban area LU3: Apply green skills in automotive and transport LU4: Perform safe storage and disposal of waste	9	21	30

Module 1: Establish and Maintain the Occupational Health and Safety System

Objective of the module: The aim of this module to get knowledge, skills and understanding to establish and maintain the occupational Health and Safety Systems

Duration: 60 hours **Theory:** 18 hours **Practical:** 42 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Examine hazards at workplace	The trainee will be able to: 1. Identify potential hazards at work place 2. Check noise level at work place 3. Check adequacy of ventilation at work place 4. Check the illumination level at work place 5. Check the storage of hazardous materials	• Risk assessment at workplace • Hazard identification • Types of emergencies at workplace • Types of hazards at workplace • Storage and disposal of hazardous material Activity: • Practice of identifying electrical hazards in the workplace • Practice of identifying fire hazards in the workplace	Total:12hrs Theory: 3 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard Marker Non Consumable • White board • Multimedia	• Class Room • Simulated environment

	6. Adopt preventive measures				
LU2: Follow emergency response protocol/procedure	The trainee will be able to: 1. Identify nature of emergency. 2. Raise fire alarm. 3. Control fire by fire extinguishers 4. Evacuate the workplace. 5. Gather in assembly point. 6. Perform head count. 7. Rescue the trapped injured person. 8. Provide first aid to the rescue person	• Hierarchy of control (the preferred order of risk control measures from most to least preferred that is: a) Elimination b) Substitution c) Engineering control d) Administrative controls e) And personal protective equipment • Emergency protocol/procedure for fire, hazardous chemical spills, major power failure and terrorism activity and nature disasters • Current safety principles and practices used at workplace • Procedure to maintain emergency response • Identification of unsafe condition • Procedure for head count Activity: • Perform mock drill for emergency response plan	Total: 12hrs Theory: 3hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard Marker Non Consumable • White board • Multimedia • PPEs (Safety glasses, Ear muffs/ear plugs, Protective Gloves, Cap, Safety shoes etc.)	• Class Room • Simulated environment
LU3: Carry out first aid	The trainee will be able to:	• Occupational health and safety environment (OHSE)	Total 13 hrs Theory:	Consumable • Notebooks • Pencils	• Class Room • Simulated environment

	1. Perform first aid treatment for bone fracture. 2. Perform first aid treatment for accidental severe bleeding. 3. Perform first aid treatment in simulated condition for eye injury. 4. Perform first aid treatment for electric shock	• First aid bone fracture • First aid for electric shock • First aid for bleeding • First aid for eye injury Activity: • Perform first aid treatment for bone fracture in a simulated condition • Perform first aid treatment for electrical shock in a simulated condition • Perform first aid treatment for bleeding in a simulated condition • Perform first aid treatment for eye injury in a simulated condition	4hrs Practical: 9hrs	• Erasers • Sharpeners • Whiteboard Marker Non Consumable • White board • Multimedia • Band aid • First aid box	
LU4: Report and investigate the accident at site.	The trainee will be able to: 1. Check additional risk of danger at work place. 2. Check that victim of accident received the first aid. 3. Block the	• Initial incident report • Accidental site precautions and safety • Post-accident activates Activity: • Practice to prepare an initial incident report of fake accident in a mock activity and report it	Total:12hrs Theory: 3 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard Marker Non Consumable • White board • Multimedia	• Class Room Simulated environment

	accident site 4. Collect the information about the incident 5. Develop the initial incident report			Safety manuals/MSDS	
LU5: Maintain ergonomics condition at workplace	The trainee will be able to: 1. Follow standard working posture/position at workplace 2. Maintain sufficient light at workplace 3. Use ergonomic workstations to avoid muscle fatigue 4. Follow standard exercise to avoid muscle fatigue	- Ergonomic working condition - Standard exercises to avoid muscle fatigue - Correct sitting posture - Correct illumination at workplace - Ergonomic workstations Activity: - Practice of preparing ergonomic workstation	Total: 11hrs Theory: 5 hrs Practical: 6 hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - Whiteboard Marker Non Consumable - White board - Multimedia - Chair - Table - Light	- Class Room - Simulated environment

Module2: Perform Advance Communication

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

Duration: 70 hours **Theory:** 19 hours **Practical:** 51hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Develop workplace documentation skills	The trainee will be able to: 1. Select information 2. Write important points from information 3. Select format and structure of the document. 4. Draft document 5. Check and correct draft for mistakes	• Advanced language skills • Explain the usage of resources (Dictionary, Operational manual, codes of practice organization rules & regulations and policies.) • Explain the reading procedures of standards & codes • Describe the ways to write and sequence paragraphs according to the required purpose of written material. • Elaborate spelling, punctuation and grammar for workplace document. • Business letters, memos, job applications, resumes, meeting agendas and minutes • Sequencing and gaps in content. • Elaborate the methods of proofreading and editing documents • Assessment and trainees feedback methods • Direct and indirect communication methods	Total: 33hrs Theory: 9hrs Practical: 24hrs	Consumable • Notebooks • Pen Non Consumable • White board • Multimedia • Internet • Computer system • MS Word	• Class Room/Lab

		Activity: - Practice of developing a memo in an organization according to requirement - Practice of developing a progress report of an employee in an organization			
LU2: Manage meeting at workplace.	The trainee will be able to: 1. Prepare meeting agenda as per instructions 2. Identify meeting participants 3. Check meeting arrangements 4. Maintain focus on the meeting proceedings 5. Take meeting notes. 6. Prepare the minutes of the meeting.	- Explain meeting terminologies and facilities. - Explain group dynamics in relation to managing meetings. - Relevant organizational procedures and policies regarding conduct of meetings, chairing and minutes. - Time management skills - Minutes of meetings - Meeting agendas - Understand the organizational formats for minutes and agendas. - Describe the methods of recording and storing the meeting documents. - Assessment and trainees feedback methods - Direct and indirect communication methods	Total: 37hrs Theory: 10hrs Practical: 27hrs	Consumable - Notebooks - Pen Non Consumable - White board - Multimedia - Internet - Computer system - Microphone - Speaker	Class Room

	7. Develop follow-up document with timelines.	Activity: • Practice of preparing meeting agendas and inviting participants as per requirement • Practice of arranging mockup meeting activity in an organization as per requirement • Practice of developing minutes of meeting during the session as per requirement			
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Module3: Perform Environmental Management

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

Duration: 100 hours **Theory:** 25 hours **Practical:** 75 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Collect sample of water and wastewater.	The trainee will be able to: 1. Select sampling locations, number of samples and timing from sampling plan 2. Identify hazards associate with the sampling 3. Select required sampling tool and accessories 4. De-contaminate the sample container and sampling tools 5. Collect samples according to sampling plan 6. Take temperature of water 7. Perform physical tests as per standard procedures 8. Prepare sub samples 9. Seal and label samples in the presence of witness 10. Take photos of sampling site and sample 11. Record the data in sampling document	• Properties of water and waste water • Procedure to select sampling locations • Hazards associate with the sampling • Sampling document • Sampling plan and procedures • Sampling tools and its types Activity: • Prepare a sampling plan of a small urban area unit. • Practice to collect numbers of samples as per sampling plan of water and wastewater of a small urban area unit as per standards • Practice to record sampling data in sampling documents.	Total: 24hrs Theory: 6hrs Practical: 18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Alcohol wipes • Litmus paper • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • TDS meter • PPEs	Class Room / Testing Lab

				• First Aid Kit • Dissolved oxygen meter • Containers • Water Pipelines • Boning rod • Calculator • Reagents for water test • Sampling tools • Battery chargers • Containers with lid • Particulate selector	
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LU2: Find out Water Pollution	The trainee will be able to: 1. Prepare apparatus and reagents for test 2. Measure dissolved oxygen in water 3. Check turbidity of water 4. Check total suspended solids in water 5. Check pH value of water 6. Check Electrical conductivity of water 7. Measure Chlorides and Sulfate content 8. Measure BOD and COD 9. Fill in the lab sheet 10. Compare with the NEQS	• Pollution and its types • Sources of water pollution • Composition of sewage • Procedure to calculate water pollution tests • Treatment and preventive measures for pollution • Chemical oxygen demand (COD) and Biochemical oxygen demand (BOD) • Procedure of COD and BOD test • Chlorides and Sulfate test procedure • National Environmental Quality Standards (NEQS) Activity: • Practice to measure water pollution in collected samples of drinking water and sewage water as per national environmental quality standards (NEQS)	Total: 28hrs Theory: 7hrs Practical: 21hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Alcohol wipes • Litmus paper • Lime powder • Whiteboard marker • Filter paper Non Consumable • White board • Multimedia • Internet • Computer system • PPE • TDS meter • First Aid Kit	• Class Room / Testing lab
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				• Dissolved oxygen meter • Containers • Water Pipelines • Boning rod • Calculator • Reagents for water test • Sampling tools • Battery chargers • Containers with lid • Particulate selector • COD and BOD bottles • Incubator • Conductivity meter	
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LU3: Evaluate Air Pollution	The trainee will be able to: 1. Select the sampling site 2. Check the functionality of particulate collector 3. Install the particulate selector at site 4. Evaluate environment quality standards in air 5. Measure air quality index 6. Weight and load the blank filter 7. Adjust the flow rate for a specific duration 8. Re-weight the filter 9. Calculate the mass of particulate matter 10. Calculate the concentration of particulate matter 11. Fill in the lab sheet	• Sources of Air pollution • Air Quality standards • Air Quality Index (AQI) • Management plans • Procedure to measure air quality • Methods to control air pollution • Filling of Lab sheet Activity: • Practice to measure air pollution of different sites of an urban area unit and results fill in the lab sheet	Total:24hrs Theory:6hrs Practical:18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Alcohol wipes • Safety mask • Lab sheets • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • PPEs • First Aid Kit • Air Quality Monitor • Calculator • Battery charger	Class Room / Testing Lab
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LU4: Measure Noise Pollution	The trainee will be able to: 1. Select the sampling site as per sampling plan 2. Check the functionality of the sound meter 3. Select and calibrate instrument 4. Record the reading of sound level at specified interval 5. Compile the collected data 6. Compare with NEQS 7. Prepare the report	• Source of noise pollution • Procedure to measure sound quality • Sound level standards • Procedure to control noise pollution • Calibration of instruments • Record reading and report writing Activity: • Practice to measure noise pollution of a small urban area site with sound meter and compare collected data with NEQS • Practice to record readings of sound level at specified interval and prepare report	Total: 24hrs Theory: 6hrs Practical: 18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Alcohol wipes • Safety mask • Lab sheets • White board marker Non Consumable • Multimedia • Internet	• Class Room / Testing Lab

				• Computer system • Whiteboard • First Aid Kit • Calculator • Sampling tools • Battery chargers • Sound level meter	
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Module 4: Perform 2D & 3D Engineering Drawings using CAD Software

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform 2D & 3D Engineering Drawings using CAD software

Duration:200hours

Theory: 20hours

Practical: 180 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Draw 2D shapes	The trainee will be able to: 1. Setup user interface settings for required drawing. 2. Create different 2D shapes with given measurements. 3. Edit different 2D shapes to meet requirement. 4. Insert dimensions and symbols as per requirement 5. Save the file in different drawing formats	• AutoCAD commands • Drawing techniques in CAD software • 2D CAD drawings • Dimensioning techniques and drawing symbols Activity: • Practice to draw a single line ground floor plan of a 5 Marla house and label all dimensions	Total:34hrs Theory:4 hrs Practical:30 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Auto CAD software	• Class Room / Computer Lab

				• Printer	
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LU2. Prepare final sets of 2D drawings	The trainee will be able to: 1. Develop 2D Drawing with given project specification and measurements. 2. Plot drawing on scale according to required size & orientation.	• AutoCAD commands • Drawing techniques in CAD software • 2D CAD drawings • Dimensioning techniques and drawing symbols • Sheet setting according to the scale • Plot drawing on scale • Insert Standard parts from CAD library Activity: • Practice to draw a double line working plan of 5 Marla house with all specifications / measurements and plot the drawing on scale	Total: 46hrs Theory: 4 hrs Practical: 42 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Auto CAD software • Printer	• Class Room / Computer Lab
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LU3.Develop 3D Objects	The trainee will be able to: 1. Setup 3D user interface settings for required drawing. 2. Create different 3D objects with given measurements.	• 3D modeling in AutoCAD • 3D solids • Meshes • Wireframe objects • 3D faces Activity: • Practice to setup 3D user interface setting for a specific drawing and draw 3D pictorial view.	Total: 40 hrs Theory:4 hrs Practical:36 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Auto CAD software • Printer	• Class Room / Computer Lab
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LU4. Manipulate 3D objects using 3D Editing Tools	The trainee will be able to: 1. Modify 3D objects in line with the requirements. 2. Make customized 3D models according to the requirement of given job. 3. Generate orthographic views from 3D model 4. Generate sectional/auxiliary views from 3D model as per requirement	• Difference between Surface Modeling and Solid Modeling. • Pre-set views such as isometric, top, bottom, front, left, etc. • Perspective projection and parallel projection • Constrained Orbit Activity: • Practice to modified 3D objects of a single room and customized the model according to the requirement. • Practice to generate orthographic projection of a single room and generate its section / auxiliary view.	Total: 40 hrs Theory:4 hrs Practical:36 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Auto CAD software • Printer	• Class Room / computer lab
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LU5.Render 3D Model	The trainee will be able to: 1. Apply material to required 3D Model as per given specification 2. Render and print the 3D model according to required size & orientation. 3. Apply texture to 3D model as per requirement.	• Boolean operation on 3D solid model • 3D Navigate control • Constrained Orbit • Material and light control • Insert Standard parts from CAD library Activity: • Practice to apply materials and render to a 3D model of a single room as per specification • Practice to apply texture to 3D model of a single room and print the 3D model as per scale.	Total: 40 hrs Theory:4 hrs Practical:36 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Auto CAD software • Printer	• Class Room / Computer Lab
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Module 5: Plan and Organize work

Objective of the module: The aim of this module to get knowledge, skills and understanding to Plan and Organize work

Duration: 60hours

Theory: 30hours

Practical: 30hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Interpret drawing and job order.	The trainee will be able to: 1. Read job order and interpret drawings 2. Measure the dimensions of site 3. Verify the specification details with available resources 4. Prepare list and generate the demand of the components and accessories.	• Interpretation of Drawings • Job order • Measurements of different sites Activity: • Practice to measure the boundary of a ground / open area • Practice to prepare list and generate the demand of components and accessories as per job order.	Total: 15 hrs Theory:6 hrs Practical:9 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • Drawings • Stationary Non Consumable • White board • Multimedia • Internet • Computer system • Printer • Measuring tape	• Class Room / Work Site

LU2: Estimate manpower requirement.	The trainee will be able to: 1. Identify manpower requirements 2. Calculate the man hours as per job. 3. Calculate the cost of labor services.	• Manpower • Calculation of Manpower • Procedure for man hour cost calculation. Activity: • Practice to estimate manpower requirements for a specific job. • Practice to calculate man hours for 10 cu.m concrete pouring. • Practice to calculate cost of labor services of a 5 Marla house sanitation work.	Total: 18 hrs Theory:9 hrs Practical:9 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • Set Of working drawings of 5 Marla house Non Consumable • White board • Multimedia • Internet • Computer system • Printer	• Class Room / Work Site
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LU3: Manage Facilities and utilities	The trainee will be able to: 1. Develop a plan for transportation of material 2. Identify and report the physical hazards at workplace 3. List the required facilities and utilities 4. Provide the required facilities and utilities	• Facilities and utilities required at the worksite • Planning methods & techniques • Mode of transportation of material Activity: • Practice to develop a plan for casting of column (2'x2'x10') including mode of transportation, list of materials, required man power and equipments.	Total: 15 hrs Theory: 9 hrs Practical: 6 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker • A-4 paper ream Non Consumable • White board • Multimedia • Internet • Computer system • Printer	Class Room / Work Site
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LU4: Manage Sub ordinates	The trainee will be able to: 1. Assign housekeeping task to the sub ordinates. 2. Monitor the working of sub ordinates	• Sub ordinate management techniques • Housekeeping techniques • Monitoring techniques Activity: • Mock practice to monitor and assign a housekeeping task to subordinates.	Total: 12 hrs Theory:6 hrs Practical:6 hrs	Consumable • Notebooks • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Printer	Class Room/ Worksite
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Module 6: Perform Setting out of Urban Project

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform setting out of urban project

Duration: 110hours

Theory: 20hours

Practical: 90 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare for works	The trainee will be able to: 1. Interpret layout plan of the project 2. Select required tools and equipment 3. Select required PPE 4. Plan the sequence of the work 5. Assign duties among the sub ordinates	• Explain the key prerequisites for setting out works. • Explain the different characteristics of layout plan. • Explain the procedure for calculation of man hour for the services and costing. • Describe the general procedure of setting out job. Activity: • Prepare a flowchart of an assigned work. • Prepare list and generate the demand of the equipments and machinery required for the job.	Total:16hrs Theory:4hrs Practical:12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Field book • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Class Room/Worksite

		• Perform reconnaissance survey of the site, trace the primary control points. Select the position of control points, identify the potential hazards and decide the sequence of activities. • Practice to estimate manpower requirements for the job and calculate the cost for the setting out job.			
LU2: Carryout layout for building	The trainee will be able to: 1. Establish control points in the surrounding with total station 2. Mark the grid points with total station 3. Establish the temporary benchmark 4. Mark out the excavation with lime powder 5. Establish the profile boards/offset pegs	• Describe the phases of setting out process; Horizontal control phase and Vertical control phase. • Differentiate between horizontal control points and location points. • Describe the procedure to establish the control points at a construction project. • Explain the techniques of setting out the horizontal	Total: 50hrs Theory: 8 hrs Practical: 42 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Field Book • Whiteboard Marker Non Consumable	Class Room / Worksite

	6. Mark out bed level pegs	position of structures; Baseline technique, Reference grid technique and Coordinate positioning technique. ● Explain the Baseline technique; setting out by offsets and setting out by bearing & distances ● Explain the provisions of Layout Menu of Total Station. ● Explain the methods to control verticality of multi stories structure. Activity: ● Perform the setting out of twin dwelling units (5 Marla each) using baseline technique by taking bearings & distances. ● Perform the setting out of a light frame structure building by Grid technique and set up profile boards ● Practice to establish control		• White board • Multimedia • Internet • Computer system	
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		points and temporary bench marks at suitable location in the surrounding of a public building project using coordinates of primary survey stations. ● Practice to calculate the coordinates of location points (corners) from the layout drawings of a public building with reference to coordinates of control points, create a coordinate data file and execute the setting out, marking excavation lines and fixing reference pillars etc.			
LU3: Carryout layout for sewer pipeline	The trainee will be able to: 1. Establish control points along the sewer line with total station 2. Mark the deflection points and manhole of the supply line 3. Mark the centre line 4. Erect sight rails	● Describe the components of Sewer scheme. ● Explain following; profile boards, sight rails, offset pegs, offset sight rail, stakes and slope stakes. ● Describe the procedure of setting out sewer line.	Total:22rs Theory:4 hrs Practical:18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard marker	Class Room/Worksite

	5. Establish the temporary benchmark 6. Calculate the invert levels of supply line 7. Set the invert level with boning rod	Activity: • Perform demarcation of a sewer line alignment & inspection chambers, for a battery of dwelling units, using given layout plan and perform staking for invert level which includes establishing TBM, installation of sight rails, fix rail level as per gradient etc. • Perform establishment of control points and temporary bench marks at suitable interval for setting out sewer lines for a small housing using coordinates of primary survey points. • Practice to calculate the coordinates of inspection chambers from the layout drawings of a small housing block with reference to coordinates of control points and create a coordinate data file. • Execute the setting out of sewer lines using the		• Field book Non Consumable • White board • Multimedia • Internet • Computer system	
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		above created coordinate data file, mark excavation, install offset sight rails, fix rail level as per gradient etc.			
LU4: Carryout layout for road	The trainee will be able to: 1. Establish control points with total station 2. Establish the deflection points and offset with total station 3. Establish the temporary benchmark 4. Mark the centre line 5. Set earthing profiles at required distance	• Describe components and structure of urban roads. • Describe the necessity and types of curves. • Explain elements and notations of simple curve. • Describe methods of setting out the simple curve. • Explain elements and notations of vertical curve. • Explain the elements of transition curve and its necessity. • Explain the Earthing profiles. Activity: • Solve numerical problems regarding computation of	Total: 74hrs Theory: 4hrs Practical: 18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	• Class Room/Worksite

		setting out data for a simple curve. • Practice to calculate the data for setting out vertical curve. • Prepare setting out data for circular curve, create coordinate data file and perform setting out with Total Station. • Prepare setting out data for vertical curve, create coordinate data file and perform setting out with Total Station. • Set out a small culvert after creating coordinate data file from the layout drawings. • Establish control points and temporary bench marks at suitable interval for setting out the alignment of internal roads of small housing scheme with the help of primary survey points and permanent bench mark.			
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Module7: Perform Advance Survey

Objective of the module: The aim of this module to get knowledge, skills and understanding to Perform advance survey

Duration: 180hours

Theory: 24hours

Practical: 156hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Measure distance by total station	The trainee will be able to: 1. Setup total station on a point 2. Input data (coordinates, instrument and prism height) 3. Orientate the total station horizontally and vertically 4. Target the prism on far point Compute the horizontal and vertical distance	• Describe the history of Total Station. • Describe the components and accessories of Total Station. • Describe the types of Total Station. • Explain the features of Total Station. • Describe the types of prism system. • Explain the capabilities of Total Station. • Explain the setting parameters; atmospheric correction, correction for prism constant, tilt correction, correction for curvature, mode & unit of measurement etc. • Explain the orientation of Total Station; by back sight and resection. • Describe the steps involved to make ready for measurement (setting up and orientation). • Explain the function of basic operating keys of total Station. • Explain the function of coordinate mode.	Total: 34 hrs Theory:4 hrs Practical:30 hrs	Consumable • Notebooks • Pencils • Erasers • Field Book • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system.	Class Room/Survey Field
		• Explain the distance measurement mode; horizontal, slope & vertical			

		distances, unit of measurement, fine/tracking/coarse mode, stake out and offset measurements. Activity: ● Practice to setting up a Total Station on a point (centering & leveling) and apply setting parameters (atmospheric correction, correction for prism constant, tilt correction and select mode & unit of measurement etc.) ● Practice to setting up a Total Station on a point, set parameters and measure the horizontal and slope distances of various distant points. ● Practice to setting up a Total Station on a point, set parameters and establish different points at given distances by stake out function of distance mode. ● Practice to measure the coordinates of different station points after inputting occupied station and back sight station coordinates, height of instrument & prism and orientation.			
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LU2: Measure angles by total station	The trainee will be able to: 1. Setup total station on a point 2. Input data (coordinates, instrument and prism height) 3. Orientate the total station horizontally and vertically 4. Measure horizontal angles of the station 5. Measure vertical angle of the object Measure height of the object using REM mode	• Define terms; centering, transiting, face left, Face right, swinging the telescope, horizontal & vertical axis • Explain the repetition and reiteration methods of angle measurement. • Explain the procedure to measure horizontal angles with total station • Explain the procedure to measure vertical angle with total station • Explain the procedure of setting out an angle • Explain the prolonging a line. • Explain the procedure of fixing intermediate points between two given points Activity • Practice to setting up a Total Station on a point, set parameters and measure the horizontal and vertical angles between different points. • Practice to setting up a Total Station on a point, set parameters and measure the horizontal and vertical angles between different points. • Practice to measure the horizontal angle by repetition method.	Total:35 hrs Theory:5 hrs Practical:30 hrs	Consumable • Notebooks • Pencils • Erasers • Field Book • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Class Room/ Survey Field
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		Practice to measure the height of different distant objects by using REM program mode.			
LU3: Measure area and perimeter of traverse by total station	The trainee will be able to: 1. Setup total station on a point 2. Input data (coordinates, instrument and prism height) 3. Orientate the total station horizontally and vertically 4. Target the stations of traverse one by one 5. Calculate area by using area mode of total station 6. Measure the perimeter of traverse by MLM mode	- Explain the Program menu; REM, MLM Area calculation and PLM etc. - Describe the procedure to calculate area of a traverse by total station. - Describe the procedure to calculate Perimeter of a traverse by total station. - Explain the advantages of Total Station - Explain the uses of Total Station. Activity: - Practice to measure the lengths of different survey lines through observation from a single instrument station by MLM program. - Practice to calculate the lengths of different survey lines, using already observed coordinates data of survey points by MLM program. - Practice to measure the area of a traverse by direct field observations.	Total: 35 hrs Theory: 5 hrs Practical: 30 hrs	Consumable - Notebooks - Pencils - Erasers - Field Book - Whiteboard marker Non Consumable - White board - Multimedia - Internet - Computer system - Total Station - Tripod	Class Room/Survey Field
		Practice to calculate the area of a traverse from coordinate data file by			

		MLN program. Practice to measure the perimeter of a traverse by direct field observations through MLM program.			
LU4: Find out occupied point coordinates	The trainee will be able to: 1. Setup total station on unknown coordinates station 2. Input data (instrument and prism height) 3. Input coordinates of control points 4. Target the control points one by one 5. Apply PLM mode	- Explain the Resection method of surveying. - Explain the purpose of Resection - Describe the Resection mode of total station. - Explain PLM mode of total station Activity: - Practice to find the coordinates of instrument station by resection method through distance measurement to at least two stations of known coordinates. - Practice to find the coordinates of instrument station by resection method through angle measurement to at least three stations of known coordinates.	Total: 35 hrs Theory:5 hrs Practical:30 hrs	Consumable - Notebooks - Pencils - Erasers - Field Book - Whiteboard marker Non Consumable - White board - Multimedia - Internet - Computer system	Class Room/ Survey Field

LU5: Prepare topographic plan	The trainee will be able to: 1. Setup total station on a point 2. Input data (coordinates, instrument and prism height) 3. Orientate the total station horizontally and vertically 4. Select coding for station point 5. Target the locations in the vicinity one by one 6. Download data to the computer 7. Plot the topographic plan	• Explain the Data Collection Menu of Total Station. • Describe the P code library; list of p codes, entry & editing etc. • Describe the measured data file and coordinates data file • Describe how to set Z-coordinate of occupied point. • Explain the procedure of data collection in field by Total Station. • Explain data collection in offset measurement mode. • Describe the conversion of measured data file into coordinate data file. • Describe the important features of internal memory of total Station. • Explain the functions of Memory Manager Menu; • Explain the important characteristics of Topographic map. • Describe the uses of topographic map. • Explain the development of topographic map from measured data file in AutoCAD. Activity: • Perform Data collection (minimum 20 points); comprises on setting up, setting parameters, selection of file,	Total: 41 hrs Theory:5 hrs Practical:36 hrs	Consumable • Notebooks • Pencils • Eraser • Whiteboard marker • Paper • Field Book Non Consumable • White board • Multimedia • Internet • Computer system • Plotter	Class Room/ Survey Field
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		inputting initial data, orientation and collimates the points one by one and record etc. ● Practice to set the z-coordinate of occupied point by taking observation on point of known elevation (Bench mark) and then find out the R. Ls of different points. ● Perform the practice of file maintenance, such as; searching data, editing data, rename a file, delete a file, editing P code library, loading data and sending data to personal computer & vice versa etc. ● Perform data collection with Total Station for topographic survey of a locality. ● Perform the processing of collected survey points data in AutoCAD and plot the topographic map.			
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Module 8: Construct and maintain water and waste water scheme

Objective of the module: The aim of this module to get knowledge, skills and understanding to construct and maintain water and waste water scheme

Duration: 80 hours **Theory:** 29 hours **Practical:** 51 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform preparatory activities	The trainee will be able to: 1. Identify work requirements 2. Perform site check to prevent damage to utilities 3. Select the required equipment 4. Calculate required manpower 5. Identify potential risks to public and environment 6. Select required PPE	• Disinfection procedures • Manpower • Environmental hazards Activity: • Visit a housing society for preliminary survey for construction of water and wastewater system, identify the potential hazards, existing utilities & access and prepare a report. • Calculate the manpower, tools and machinery and utilities for the above site.	Total: 19hrs Theory: 7hrs Practical: 12hrs	Consumable • Notebooks • Pencils • Insulation tape • Whiteboard marker Non Consumable • White board • Multimedia	Classroom/ On site
LU2: Construct and install pipelines	The trainee will be able to:	• Knowledge of setting out of pipeline • Knowledge of different types of pipes and jointing method	Total: 22hrs Theory: 7hrs	Consumable • Notebooks • Pencils	Classroom/ on site

	1. Perform setting out of pipeline plan 2. Check Excavation alignment and invert level 3. Join pipes and fittings 4. Calculate backfill excavation	• Components of water and wastewater system • Procedure to lay the pipeline Activity: • Practice to perform bell and spigot joint of RCC sewerage pipe • Practice to perform jointing of HDPVC pipeline for water supply • Practice to install sluice valve, no return valve, pressure gauge and pressure release valve • Practice to perform setting out of pipeline according to pipeline plan	Practical:15hrs	• Insulation tape • RCC pipe • HDPVC pipe • Rubber ring • Cement bag • Sand • Whiteboard marker • Solvent/bond Non Consumable • White board • Multimedia • Internet • Computer system • Sluice valve • No return valves • Pressure release valve	
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LU3: Finalize work	The trainee will be able to: 1. Perform leakage test as per requirement 2. Check, maintain and store equipment, tools and materials 3. Restore work site to meet environmental and organizational requirements. 4. Complete workplace records and constructed drawings	• Knowledge of different types leakage test • Knowledge of procedure of hydraulic pressure test Activity: • Practice to perform hydraulic pressure leakage test on pre laid section of pipeline	Total: 20hrs Theory: 8hrs Practical: 12hrs	Consumable • Notebooks • Pencils • RCC pipe • HDPVC pipe • Rubber ring • Cement bag • Sand • Whiteboard marker • Solvent/bond Non Consumable • White board • Multimedia • Internet • Computer system • Hydraulic pump	Classroom/ on site
LU4: Conduct maintenance and repairs	The trainee will be able to:	• Knowledge of decontamination of materials	Total: 19hrs Theory: 7hrs	Consumable • Notebooks • Pencils	Classroom/ on site

	1. Isolate the work area. 2. Select required repair method 3. Decontaminate material before installing 4. Perform water leakage test	• Knowledge of Self-cleaning velocity Activity: • Practice to prepare a checklist to identify leakage and repair water supply pipeline.	Practical:12hrs	• Whiteboard marker • HDPVC pipe • Solvent/bond Non Consumable • White board • Multimedia • Internet • Computer system • Hydraulic pump	
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Module 9: Prepare Detailed Estimate

Objective of the module: The aim of this module to get knowledge, skills and understanding to prepare detailed estimate

Duration: 200 hours **Theory:** 26 hours **Practical:** 174 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Work out quantities for building	The trainee will be able to: 1. Draw the center lines in plan. 2. Sum up the lengths of center lines. 3. Calculate the quantities of items of work for building 4. Calculate the quantity of water and sanitary item of works	• Types of buildings and their categories • Components of building • Describe the important items of work of building portion, water supply and sanitary portion with unit of measurement and brief specification • Describe the table of abstract of quantities/BOQ and measurement sheets • Explain the rules for taking quantities of item of work • Method of taking of quantities of walling; centerline method and long and short wall method	Total: 24hrs Theory: 03hrs Practical: 21hrs	Consumable • Notebooks • Pencils • Detail drawings of building • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • Calculator	Classroom

	5. Calculate the quantity of electrical item of works 6. Implement the principles of deduction for surface rendering	Activity: • Practice in taking out quantities of work for different shapes of wall (T, L U and circular) • Practice to take out quantities for (D,O&H shape) of boundary wall • Practice to take out quantities of item of work of building portion for a two room with veranda. • Practice to take out quantities of item of work of building portion for a single bed dwelling unit • Practice to take out quantities of item of work of water supply and sanitation portion for a single bed dwelling unit • Practice to take out quantities of item of work of electrification portion for a single bed dwelling unit			
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LU2: Prepare Abstract of Cost	The trainee will be able to: 1. Draw Abstract of Cost table. 2. Calculate the amount of each item of work. 3. Add contractor's profit on amounts of relevant rates. 4. Add contingencies. 5. Add building Services charges for the building. 6. Add other overhead charges for the building.	• Describe the different pattern of abstract of cost • Types of detailed estimate • Explain the Market rate schedule • Methods of calculating detailed estimation • Explain the contractor profit and taxation • Explain the contingencies • Explain overhead charges for a project • Material statement Activity: • Prepare the detailed estimate for a two room with veranda using the measurement sheet already prepared and abstract rates from MRS • Prepare the detailed estimate for a single bed dwelling unit using the measurement sheet already prepared and abstract rates from MRS	Total:24hrs Theory:3hrs Practical: 21 hrs	Consumable • Notebooks • Pencils • MRS • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • Calculator •	Classroom/ Hydraulic shop
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LU3: Prepare road estimate.	The trainee will be able to: 1. Calculate the quantity of vegetation 2. Calculate area of site for surveying and leveling. 3. Calculate area of permanent land. 4. Calculate the volume of earth work. 5. Calculate area of temporary land. 6. Calculate volume of sub-base and base course of site. 7. Calculate area of surfacing 8. Prepare abstract of cost	• Describe the components of carriage way • Explain the road structure. • Describe the types of roads. • Describe the brief specifications of item of road works. • Explain the methods of computation of earthwork for roads; average depth, mean area, coordinates & graphical methods • Explain the lead, lift, barrow pit, gradient and side slopes etc. • Describe the types & components of culvert & bridges. Activity: • Practice to calculate quantity of earthwork for 50 feet length of embankment by mean area, average depth, coordinates & graphical methods • Compute the filling & cutting for a reach of road using the profile leveling data (L-section & X-sections) • Prepare detailed estimate for a bitumen road using earthwork data as above.	Total:24hrs Theory:03hrs Practical:21 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Classroom
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		• Prepare detailed estimate for urban concrete road having footpath and storm water inlets. • Prepare a complete estimate of two span bridge including bar bending schedule.			
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LU4: Prepare estimate for special repair	The trainee will be able to: 1. Take the manual measurements from site. 2. Calculate the volume of dismantling base & sub-base. 3. Calculate volume of sub-base and base course of road. 4. Calculate area of surfacing 5. Prepare abstract of cost	• Knowledge of Special Repairs • Components involved in special repair of road Activity: • Prepare a special repair estimate of 1-Kilometer-long flexible road and prepare abstract of cost	Total:27hrs Theory:3hrs Practical:24 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Classroom
LU5: Prepare Annual repair estimate of building/road	The trainee will be able to: 1. Identify the items of work for Annual Repair of building/road.	• Differentiate between Annual repair and special repairs • Explain the yard stick for annual repair of buildings and roads. Activity: • Prepare AR/SR estimate for a public building using PWD Yard stick/ guide line. • Prepare AR/SR estimate for urban	Total:24hrs Theory:3hrs Practical:21 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable	Classroom

	2. Calculate quantities of items of work for Annual Repair. 3. Prepare Abstract of Cost for Annual Repair for building/road.	roads using NHA Yard stick/ guide line.		• White board • Multimedia • Internet • Computer system	
LU6: Prepare estimate of water supply scheme	The trainee will be able to: 1. Calculate the quantity of trench work 2. Calculate quantities of pipes. 3. Calculate the quantities of appurtenance 4. Calculate the quantities of tank & taps. 5. Prepare abstract of cost.	• Describe the components of water supply scheme. • Explain the brief specifications of Item of works for water supply scheme and their measurement units. • List the components of tube well. • List the valves used in water supply scheme. Activity: • Prepare detailed estimate for distribution network of water supply scheme of a small housing colony(100 houses). • Prepare detailed estimate of Tube well (boring, installation of turbine & construction of pump room) for a small housing colony. • Prepare complete estimate of R.C.C Overhead water tank for a housing colony.	Total:28hrs Theory:04hrs Practical:24 hrs	Consumable • Notebooks • Pencils • Layout plan for services and details • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Classroom

LU7: Prepare Rate analysis of building item of works	The trainee will be able to: 1. Identify materials and their rate 2. Calculate materials and their cost by input rates (MRS). 3. Calculate the labour charges for job 4. Calculate the carriage charges for the ingredients. 5. Add sundries lump sum charges 6. Sum up the amounts and add contractor's profit. 7. Add water charges	• Carriage Charges • List of all building items of work • Explain Labor rates • Explain Sundries Lump sum charges • Knowledge of MRS Activity: • Practice to prepare a rate analysis of 5 Marla building items of work and prepare abstract of cost	Total:25hrs Theory:04hrs Practical:21 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Classroom
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LU8: Prepare material statement	The trainee will be able to: 1. Select materials required for work 2. Evaluate the proportion of different materials in mix/mortar 3. Calculate the number of bricks 4. Fill the quantities in schedule of material statement	• Explain Material statement • Procedure of preparing material statement • Components of material statement • Demolition waste • Construction material Activity: • Practice to prepare material statement for construction • Practice to prepare material statement for demolition waste.	Total:24hrs Theory:03hrs Practical:21 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Classroom
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Module 10: Prepare Zone Plan

Objective of the module: The aim of this module to get knowledge, skills and understanding to prepare zone plan

Duration: 110 hours **Theory:** 20 hours **Practical:** 90 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Prepare location plan	The trainee will be able to: 1. Select scale for location plan 2. Select location of site on survey map 3. Draw outline of site plan 4. Draw main features of site plan 5. Draw surrounding properties and approach road on site plan	• Types of site plans • Conventional land use symbols • Bylaws of all regulatory organizations for urban development (Government and Private) • Procedure to calculate percentage land use. • Road plan components Activity: • Practice to draw the site plan of a plot in the housing society • Practice to extract percentage area of residential, commercial and recreational etc. as per concerned authority's by laws.	Total:55hrs Theory:10hrs Practical:45hrs	Consumable • Notebooks • Pen • Drawing Pencils • Geometry box • Thumb Pin/ Squash Tape • Drawing Sheets • Whiteboard marker Non Consumable	Classroom/ Drawing Hall

	6. Draw legend and North direction on site plan			• White board • Multimedia • Internet • Computer system • Drawing Board • T-Scale • Set Square • Flexible Curve	
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LU2: Prepare zoning map with percentage plan	The trainee will be able to: 1. Draw boundary line on survey map 2. Calculate site area 3. Mark different zone on survey map 4. Compare the calculated zone area with standards 5. Draw road network plan 6. Draw ultimate waste disposal of scheme 7. Prepare land use percentage legend	• Knowledge of zone planning • • Knowledge of different uses of land • Procedure to calculate percentage land use. • Knowledge of planning components Activity: • Practice to prepare zoning map for a small housing society using the given data and survey map	Total: 55hrs Theory: 10hrs Practical: 45hrs	Consumable • Notebooks • Pen • Drawing Pencils • Geometry box • Thumb Pin/ Squash Tape • Drawing Sheets • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • Drawing Board	Classroom/ Drawing Hall
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				• T-Scale • Set Square Flexible Curve	
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Module 11: Perform Basic Green Skills in Urban Area Planning and Management

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform basic green skills in urban area planning and management

Duration: 30 hours **Theory:** 9 hours **Practical:** 21 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Apply green skills in construction sector	The trainee will be able to: 1. Identify building as per zone plan 2. Identify climate condition of the construction site 3. Avoid environmental degradation 4. Select eco-friendly material 5. Identify construction waste 6. Apply waste reduction techniques	• Explain the importance of Green Skills. • Describe official zone planning • Principles of green skills • Parking lots and their importance • Waste management practices • Green consumables and non-consumables • Horticulture • Type of waste material • Procedure for disposal of waste material • Knowledge of waste reduction techniques • Describe SOP for disposal of construction waste • Describe SOP for disposal of hazardous waste Activity:	Total:8hrs Theory:02hrs Practical:06hrs	Consumable • Notebooks • Pen • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • PPE • Color coded waste bin	Classroom/ On site

	7. Dispose unusable waste as per SOP 8. Transport recycling material to designated area	Practice of selecting ecofriendly material for a specific construction job		- Color tags - Zone Planning Map	
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LU2: Develop green zones in urban area	The trainee will be able to: 1. Prepare plantation plan at soft area and bank of canals 2. Arrange green resources 3. Develop plans for park installation 4. Manage resources efficiently 5. Arrange eco-friendly garbage disposal	• Knowledge of Parking lots and their importance • Knowledge of Park Development Plans • Knowledge of Horticulture • Knowledge of Landscaping • Knowledge of Green Manure • Method of decomposition of bio degradable material Activity: • Practice of preparing plantation plan for a housing society • Practice to develop plantation layout plan for a park • Practice to develop disposal site for bio degradable material (green waste)	Total:7hrs Theory:02hrs Practical:06hrs	Consumable • Notebooks • Pen • Drawing sheet • Drawing tools • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • AutoCAD	Classroom/ On site
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LU3: Apply green skills in automotive and transport	The trainee will be able to: 1. Identify the need of replacement of filters and oils 2. Identify green consumables 3. Identify recycle and reusable material 4. Segregate the scrap according to material	• Knowledge of automotive workshops • Knowledge of emissions of automotives • Knowledge of need of replacement of oil and filters • Knowledge of Eco-friendly fuels Activity: • Practice of identifying the need of replacement of filter and oil of automotive • Develop environment friendly plan for storage of oil waste, scraps and rubbish for automotive workshop	Total: 5hrs Theory: 02hrs Practical: 03hrs	Consumable • Notebooks • Pen • Lubricant • Filters • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Color coded waste bin • Computer system • Automotive Tool box	Classroom/ Automotive Workshop
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LU4: Perform safe storage and disposal of waste	The trainee will be able to: 1. Identify different types of waste material 2. Identify types of containers to store the different types of waste material 3. Store the waste materials according to standards 4. Dispose-off waste material according to green and safety procedures	• Types of solid waste • Method of storage of solid waste • Types of waste bin • Method of disposal of bio degradable waste • Method of disposal of in organic solid waste • SOP for disposal of hazardous waste Activity: • Practice to segregate the solid waste of the institute/workshop and store in the specific bin • Practice to dispose-off hazardous waste (Oil/chemicals) of the workshop according to green and safety procedure	Total:9hrs Theory:03hrs Practical:06hrs	Consumable • Notebooks • Pen • Lubricant • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • Color coded waste bin • PPE	Classroom/ Workshop
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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 Supervisor include:

- Work performances, for example perform basic communication, maintain personal health, hygiene and safety and perform basic computer operations
- Demonstrations, for example Identifying Electrical Circuits and Measurements

- 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 electrical circuits and how they can measure these circuits
- Paper-based tests, such as multiple choice or short answer questions on communication at work place policy and procedures, Electrical Circuits and Measurements
- Indirect assessment is the method used where the performance could not be watched and evidence is gained indirectly.

Examples for indirect assessment of a Digging Operation Supervisor include:

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

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 *Dies & Mould Technology*

This curriculum consists of 11modules:

- **Module 1:** Establish and Maintain the Occupational Health and Safety System
- **Module 2:** Perform Advance Communication
- **Module 3:** Perform Environmental Management
- **Module 4:** Perform 2D and 3D drawings using CAD Software
- **Module 5:** Plan and Organize work
- **Module 6:** Perform Setting out of Urban Project
- **Module 7:** Perform Advance Survey
- **Module 8:** Construct and Maintain water and waste water scheme
- **Module 9:** Prepare Detailed Estimate
- **Module 10:** Prepare Zone plan
- **Module 11:** Perform Basic Green Skills for Urban Area Planning and Management

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.	Application Software	26
2.	Safety helmet	1
3.	Safety goggles	1
4.	Safety gloves	1
5.	PPE	1
6.	Safety shoes	1
7.	Litmus paper	10
8.	Safety ma	10
9.	TDS meter	10
10.	First Aid Kit	10
11.	Dissolved oxygen meter	10
12.	Containers	10
13.	Air Quality Monitor	5
14.	Sound level meter	5
15.	AutoCAD	5
16.	Measuring tape	5
17.	Ranging rod	5

18.	Water Pipelines	5
19.	Waste water pipelines	5
20.	Boning rod	5
21.	Safety Harness	5
22.	Tee square	5
23.	Set square	10
24.	Ruler	5
25.	Pen	2
26.	Pencil	5
27.	Notebook	5
28.	compass	5 each
29.	Safety Belt	2
30.	Scissor	5
31.	Calculator	5
32.	Pumping station	5
33.	Total station	5
34.	Computer	5
35.	Internet	5
36.	Fire Blankets	5
37.	Drawing sheet	5
38.	Umbrella with stand	5

39.	Prism rod	5
40.	Reagents for water test	5 each
41.	Sampling tools	10
42.	Battery chargers	25
43.	Pegs	10
44.	Lime powder	10
45.	Tags	5
46.	Thermometer	5
47.	Ziplock bags	5
48.	Log book	10 set
49.	Containers with lid	10
50.	Ball Peen Hammer	10
51.	Chalk	5
52.	Scotch tape	5
53.	Particulate selector	5
54.	Alcohol wipes	5

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 Books

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. Establish and Maintain the Occupational Health and Safety System	60	06
B. Perform Advance Communication	70	07
C. Perform Environmental Management	100	10
D. Perform 2D and 3D drawings using CAD Software	200	20
E. Plan and Organise work	60	06
F. Perform Setting out of Urban Project	110	11
G. Perform Advance Survey	180	18
H. Construct and Maintain water and waste water scheme	80	08

Competency Standard	Estimate of hours	Credit
I. Prepare Detailed Estimate	200	20
J. Prepare Zone Plan	110	11
K. Perform Basic Green Skills for Urban Area Planning and Management	30	03

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 Moez	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:

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. 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