

Curriculum For “Urban Area Planning and Management”

(Level -5)

18th to 22th April 2022



**National Vocational & Technical
Training Commission**

Table of Contents

Introduction	3
Definition/ Description of the training programme for Urban Area Manager	3
Purpose of the training programme	3
Overall objectives of training programme	3
Competencies to be gained after completion of course	3
Possible available job opportunities available immediately and later in the future	3
Trainee entry level	4
Minimum qualification of trainer	4
Recommended trainer: trainee ratio	4
Medium of instruction i.e. language of instruction	4
Duration of the course (Total time, Theory & Practical time)	5
Sequence of the Modules	6
Summary – overview of the curriculum	8
Module 1: Perform Sampling of Construction Materials	13
Module2: Perform Material Testing	22
Module3: Perform Inventory Management	31
Module 4: Manage and Supervise the Job Activities	35
Module 5: Develop 3D Model using REVIT	39
Module6: Prepare Topographic Map by GPS	42
Module 7: Apply ArcGIS and Google Earth in Urban Area Management	49
Module 8: Plan a Project in Primavera P6	52
Module 9: Develop entrepreneurial skills	55
Module 10: Develop Practice Professionalism	59
General assessment guidance for Urban Area Planning and Management	61
LIST OF TOOLS, MACHINERY and EQUIPMENT	65
LIST OF CONSUMABLE SUPPLIES	67
Credit values	68
Members of the Curriculum Development Committee	70
Members of the Curriculum Review Committee	71

Introduction

Definition/ Description of the training programme for Urban Area Manager

There is an increasing demand of the Urban Area Manager in construction industry. If an individual is planning to pursue a career in construction industry, 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

- Perform Sampling of Construction Materials
- Perform Material Testing
- Perform Inventory Management
- Manage and Supervise the Job Activities
- Develop 3D Model using REVIT
- Prepare Topographic Map by GPS
- Apply ArcGIS and Google Earth in Urban Area Management
- Plan a Project in Primavera P6
- Develop Entrepreneurial Skills
- Practice Professionalism

Possible available job opportunities available immediately and later in the future

- Urban Area Manager
- GIS operator
- REVIT operator

Trainee entry level

Level 4 in Urban Area Planning and Management

Minimum qualification of trainer

Teacher should have DAE in Civil / Mechanical with specialization in construction machinery with at least five years' experience in construction Industry with adequate computer skills (Revit, GIS software, Primavera P6)

OR

Teacher should have B.Sc Engg / B.Engg Tech in Civil / Mechanical with at least one years' experience in Construction Industry with adequate computer skills (Revit, GIS software, Primavera P6)

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 10 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.	Perform Sampling of Construction Materials	5	4.2	42	5.7	57	9.9	99
2.	Perform Material testing	5	5.9	59	8.7	87	14.6	146
3.	Perform Inventory management	5	4.9	49	2.4	24	7.3	73
4.	Manage and Supervise the Job Activities	5	4.7	47	3.0	30	7.7	77
5.	Develop 3D Model using REVIT	5	3.0	30	9.0	90	12.0	120
6.	Prepare Topographic Map by GPS	5	3.9	39	10.2	102	13.9	141
7.	Apply ArcGIS and Google Earth in Urban Area Management	5	2.0	20	8.4	84	10.4	104
8.	Plan a Project in Primavera P6	5	4.7	47	9.3	93	14	140
9.	Develop Entrepreneurial Skills	5	3.6	36	2.4	24	6.0	60
10.	Practice Professionalism	5	9.0	90	15.0	150	24	240
Total			45.9	459	74.1	741	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: Perform Sampling of Construction Materials 99 Hours	Module 2: Perform Material Testing 146 Hours	
Module 4: Manage and Supervise the Job Activities 77 Hours		

Module 5: Develop 3D Model using REVIT 120 Hours	Module 8: Plan a project in Primavera P6 140 Hours	Module 10: Practice Professionalism 240 Hours
Module 3: Perform Inventory Management 73 Hours	Module 9: Develop Entrepreneurial skills 60 Hours	
Module 6: Prepare Topographic Map by GIS 141 Hours	Module 7: Apply ArcGIS and Google Earth in Urban Area Management 104 Hours	

Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 1: Perform Sampling of Construction materials Aim: After successful completion of this module, the trainee is competent in performing sampling of construction materials	LU1. Carry Out Initial Preparatory Activities LU2. Collect Aggregates Samples LU3. Extract soil samples LU4. Prepare fresh concrete samples at site LU5. Extract asphalt concrete test samples at site LU6. Extract hardened concrete test samples at site LU7. Preserve and Document the Sampling LU8. Handle, Store & Transport the Samples	33	57	90
Module 2: Perform Material Testing Aim: After successful completion of this module, the trainee is competent in performing material testing	LU1. Perform preliminary test on soil sample LU2. Perform Bearing capacity test on soil sample LU3. Perform test on cement sample LU4. Perform test on aggregate sample LU5. Perform test on fresh concrete sample LU6. Perform test on hardened concrete sample LU7. Perform test on brick sample LU8. Perform test on steel sample	61	69	130

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 3: Perform Inventory Management Aim: After successful completion of this module, the trainee is competent in performing inventory management	LU1. Measure Raw material at site LU2. Perform the storage of materials and tools LU3. Maintain the Log Register LU4. Declare Procurement Plan	49	21	70
Module 4: Manage and Supervise the Job Activities Aim: After successful completion of this module, the trainee is competent in Performing Battery Service of Vehicle	LU1. Plan for on-site operations LU2. Supervise work activities to achieve desired results LU3. Perform on- site inspection LU4. Prepare the inspection report.	47	33	80

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 5: Develop 3D Model using REVIT Aim: After successful completion of this module, the trainee is competent in developing 3D model using REVIT	LU1. Setup Interface LU2. Create building layout LU3. Create construction document LU4. Render Model	30	90	120
Module 6: Prepare Topographic Map by GPS Aim: After successful completion of this module, the trainee is competent in preparing topographic map by GPS	LU1. Set out co-ordinates by GPS LU2. Set coordinates within REFLEXW by GPS LU3. Set out Civil Engineering Projects by GPS LU4. Utilize Grid Reference and GPS usage LU5. Illustrate Administrative Index LU6. Locate Specific Area in Sheet LU7. Set out Legends of Topographic Sheet	25	105	130

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 7: Apply ArcGIS and Google Earth in Urban Area Management Aim: After successful completion of this module, the trainee is competent in applying ArcGIS and Google Earth in Urban Area Management	LU1. Use of Google Earth LU2. Apply Geo referencing in ArcGIS LU3. Perform analysis In ArcGIS	20	90	110
Module 8: Plan a Project in Primavera P6 Aim: After successful completion of this module, the trainee is competent in planning a project in Primavera P6	LU1. Perform Basic operation in Primavera P6 LU2. Perform Project Activities Scheduling in Primavera P6 LU3. Perform Project Resources Costing &Planning in Primavera P6 LU1. Manage Project in Primavera P6	47	93	110

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
Module 9: Develop Entrepreneurial Skills Aim: After successful completion of this module, the trainee is competent in performing basic Technical Drawing	LU1. Develop a business plan LU2. Collect information regarding funding sources LU3. Develop a marketing plan LU4. Develop basic business communication skills	39	21	60
Module 10: Practice Professionalism Aim: After successful completion of this module, the trainee is competent in performing basic Technical Drawing	LU1. Develop Portfolio for industry LU2. Perform Internship	90	180	270

Module 1: Perform Sampling of Construction Materials

Objective of the module: The aim of this module to get knowledge, skills and understanding to perform sampling of construction materials

Duration: 99 hours **Theory:** 42 hours **Practical:** 57 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU 1 Carry Out Initial Preparatory Activities	The trainee will be able to: 1. Select the sampling location 2. Identify hazards associated with the sample preparation 3. Select sampling equipment and tools 4. Prepare all solutions ready for field use. 5. Identify faulty or unsafe components and equipment and report to concern person	• State Types and uses of sampling tool & equipment • Sample preparation steps (washing, weighing and sieving) • Sampling documents Activity: • Select and Prepare tools/equipment's for sampling of given material. • Identify faulty tools/equipment and report to concern person.	Total 9 hrs Theory: 3 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Tags • Containers • Ziplock bags • Non Consumable • White board • Multimedia	• Class Room • Site

	6. De-contaminate the sample container and sampling tools				
LU 2 Collect Aggregates Samples	The trainee will be able to: 1. Select required tools and equipment 2. Collect required quantity of aggregates samples 3. Perform sample preparations 4. Take photos of sampling sites and samples 5. Record sample appearance and environmental conditions	• Types of aggregate • Methods of collecting test samples based upon the types of tests and materials. • Sampling rules for various materials such as; no. of samples, witnesses and sealing of samples etc. • Selection of sampling tools and equipment, sample container, quantity of each sample, weighing, measuring, mixing, sieving as per type of sample and tests. • Physical, chemical & mechanical properties of engineering materials. Activity: • Collect required quantity of aggregates samples for testing as per SOP. • Practice for storing and stacking the test samples of	Total 10 hrs Theory: 4 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Tags • Containers • Ziplock bags Non Consumable • White board • Multimedia	• Class Room • Site

		various materials as per SOP.			
LU 3 Extract soil samples	The trainee will be able to: 1. Select required tools and equipment 2. Decontaminate the sample container and sampling tools 3. Perform soil sample extraction 4. Take photos/snaps of sampling sites and samples. 5. Record the results of field tests in the sampling document	• Types of soil • Procedure of soil sample extraction Activity: • Perform soil sample extraction as per standard procedure. • Practice of tagging/ numbering/labelling the collected samples as per standard.	Total 15 hrs Theory: 6 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Tags • Containers • Ziplock bags Non Consumable • White board • Multimedia	• Class Room • Field

	6. Record sample appearance and environmental conditions				
LU 4 Prepare fresh concrete samples at site	The trainee will be able to: 1. Select required tools and equipment 2. Collect samples of fresh concrete from batch	• Types of concrete • Ingredients of Cement Concrete • Factors affecting the workability of concrete. • Recommended values of slumps for various conditions of placements. • Different methods of mix design, transportation of fresh concrete it's placing and compaction. • Procedures of packing of test samples for transportation. Activity: • Prepare fresh concrete samples at site as per standard procedure. • Prepare the sampling documents such as fill in the sample date, time, weight/measure, temperature, pH value, sampler name, sample tag/ ID#, preservative used, sample location and	Total 12 hrs Theory: 6 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Tags • Containers • Ziplock bags Non Consumable • White board • Multimedia	• Class Room • Site

	3. Cast concrete cubes/cylinders in required quantity 4. Label the concrete cubes/cylinders and engrave identification mark on it. 5. Store concrete cubes/cylinders in curing tank 6. Record the results of field tests in the sampling document	sampling equipment etc.			
LU 5 Extract asphalt concrete test samples at site	The trainee will be able to: 1. Select required tools and equipment	• Ingredients of asphalt concrete • Procedure of asphalt concrete sampling • Difference between normal concrete and asphalt concrete	Total 15 hrs Theory: 6 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker	• Class Room • Field

	2. Collect the required numbers of asphalt concrete layer cores by core cutter 3. Record the results of tests in the sampling document 4. Re-instate all disturbed surfaces	Activity - Extract asphalt concrete test samples at site as per standard procedure. - Practice of packing test samples for transportation.		- Tags - Containers - Ziplock bags Non Consumable - White board - Multimedia - Core cutter	
LU 6 Extract hardened concrete test samples at site	The trainee will be able to: 1. Select required tools and equipment	- Hardened concrete - Difference between fresh concrete and hardened concrete - Procedure of extraction of hardened concrete - Knowledge of core cutting machine Activity: - Extract hardened concrete test samples at site as per standard produce.	Total 15 hrs Theory: 6 hrs Practical: 9 hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - White board marker - Tags - Containers - Ziplock bags	- Class Room - Field

	2. Collect the required numbers of cement concrete slab cores by core cutter 3. Record the results of tests in the sampling document 4. Re-instate all disturbed surfaces	Practice to record the results of tests in the sampling document.		- Non Consumable - White board - Multimedia - Core cutting machine	
LU 7 Preserve and Document the Sampling	The trainee will be able to: 1. Prepare sub-samples and back-up samples 2. Seal and label the sample & sub-samples in the presence of witnesses	- State Preventive and corrective measures for tools and equipment - Sample preservation method, such as pH. control, chemical addition, refrigeration and freezing etc. - Standard practice of tagging/numbering/labelling the collected samples. - Standard practice for storing and stacking the test samples of various materials as per standards. - Prepare the sampling	Total 13 hrs Theory: 7 hrs Practical: 6 hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - White board marker - Tags - Containers - Ziplock bags	- Class Room - Field

	3. Complete the sampling document	documents such as fill in the sample date and time and weight/measure, temperature, pH value, sampler name, sample tag/ ID#, preservative used, sample location and sampling equipment etc • Practice of tagging/numbering/labelling the collected samples. • Practice for storing and stacking the test samples of various materials as per standards. Activity: • Practice to Prepare sub-samples and back-up samples. • Practice to Seal and label the sample & sub-samples in the presence of witnesses.		Non Consumable • White board • Multimedia	
LU 8 Handle, Store & Transport the Samples	The trainee will be able to: 1. Perform sample storage 2. Deliver sample store reception	• Standard procedures of packing of test samples for transportation. Activity: • Practice to transport sample test as per standard procedure.	Total 10 hrs Theory: 4 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners	• Class Room • Field

	point 3. Report any unwanted situation to supervisor	Practice for storing and stacking the test samples of various materials as per standards.		- White board marker - Tags - Containers - Ziplock bags - Non Consumable - White board - Multimedia	
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Module2: Perform Material Testing

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

Duration: 146 hours **Theory:** 59 hours **Practical:** 87 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform preliminary test on soil sample	The trainee will be able to: 1. Select sample 2. Check moisture content of soil 3. Perform test for Atterberg limits 4. Perform test for the bulk and dry density 5. Perform standard and modified compaction test 6. Fill in the test sheet	• Types of Soil tests • Atterberg apparatus • Atterberg limit test • Compaction test and its procedure • Bulk and dry density Activity • Perform test for Atterberg limits. • Perform test for the bulk and dry density.	Total: 15hrs Theory: 9hrs Practical: 6hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board • Computer • Atterberg Apparatus • Compaction apparatus • Internet	Class Room / Lab

LU2: Perform Bearing capacity test on soil sample	The trainee will be able to: 1. Conduct site clearance 2. Setup SPT apparatus 3. Apply blow of standard weight 4. Calculate the relative density 5. Fill in the test sheet	• Bearing capacity test on soil • Bearing capacity test procedure • Relative density • SPT Apparatus Activity: Practice to Perform Standard Penetration Test (SPT) to determine Bearing capacity of soil sample.	Total:18hrs Theory:9hrs Practical:9hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board • Computer • Internet • SPT Apparatus	Class Room / Lab
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LU3: Perform test on cement sample	The trainee will be able to: 1. Select sample 2. Check fineness of cement 3. Prepare cement paste of standard consistence 4. Find out initial and final setting time 5. Perform test for soundness of cement 6. Perform test for compressive and tensile strength of cement 7. Fill in the test sheet	• Cement and its properties • Types of cement • Procedure of testing soundness and fineness of cement • Initial and final setting time of cement • Formulas used in cement testing • Briquette test for cement • Compressive strength • Tensile strength • Procedure of Le-Chatelier apparatus • Procedure of Briquette apparatus Activity: • Perform test for soundness of cement by Le-Chatelier Method. • Perform test for compressive and tensile strength of cement.	Total:19hrs Theory:7hrs Practical:12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board • Computer • Le chatlier apparatus • Briquette apparatus	Class Room / Lab
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LU 4 Perform test on aggregate sample	The trainee will be able to:	• Types of materials • Particle size distribution • Procedure of Sieve analysis • Types of densities • Procedure of Flakiness index • Procedure of Elongation index • Specific gravity • Gradation of aggregate Activity: • Perform test for bulk density of aggregate • Perform test for flakiness index of coarse aggregate • Perform test for elongation index of coarse aggregate	Total 18 hrs Theory: 6 hrs Practical: 12 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Whiteboard marker • Test sheet Non Consumable • White board • Multimedia • Sieve set • Flakiness and elongation test apparatus	• Class Room/Lab
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	1. Select Sample 2. Perform test for particle size distribution of fine and coarse aggregate 3. Perform test for bulk density of aggregate 4. Perform test for flakiness index of coarse aggregate 5. Perform test for elongation index of coarse aggregate 6. Perform test for specific gravity of materials 7. Fill in the test sheet				
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LU 5 Perform test on fresh concrete sample	The trainee will be able to: 1. Select Sample 2. Perform test for workability by slump cone 3. Perform test for workability by compacting factor 4. Fill in the test sheet	• Concrete and concrete mix • Types of concrete based on strengths • Procedure of Slump cone apparatus • Procedure of Compacting factor apparatus • Properties of concrete • Knowledge of Mortar Activity: • Perform test for workability by slump cone. • Perform test for workability by compacting factor.	Total: 19hrs Theory: 7hrs Practical: 12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board • Computer • Slump cone apparatus • Compacting factor test apparatus	• Class Room/Lab
LU 6 Perform test on hardened concrete sample	The trainee will be able to:	• Tests performed on Hardened concrete • Procedure of Rebound hammer • Procedure of rebar detection	Total: 19hrs Theory: 7hrs Practical: 12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners	• Class Room/Lab

	1. Select Sample 2. Perform field test by Rebound hammer 3. Perform test for rebar detector 4. Fill in the test sheet	Activity: • Perform field test by Rebound hammer • Perform test for rebar detector		• White board marker • Test sheet Non Consumable • White board • Computer • Rebound hammer • Rebar detector	
LU 7 Perform test on brick sample	The trainee will be able to:	• Bricks and its types • Size of brick and its components • Water absorption capacity • Procedure of finding dimensional tolerance • Efflorescence • Procedure to find efflorescence • Procedure to perform hardness and abrasion test on brick • Types of brick laying pattern Activity:	Total: 19hrs Theory: 7hrs Practical: 12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board	• Class Room/Lab

	1. Select brick sample 2. Perform test for compressive strength of brick 3. Perform test for water absorption of brick 4. Check dimensional tolerance of brick 5. Perform test for efflorescence of brick 6. Perform hardness test on brick 7. Perform abrasion test on brick 8. Fill in the test sheet	• Perform test for compressive strength of brick • Perform test for water absorption of brick • Perform test for efflorescence of brick • Perform hardness test on brick • Perform abrasion test on brick		• Computer • Measuring scale • Scouring tool	
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LU8: Perform test on steel sample	The trainee will be able to: 1. Select steel sample 2. Perform test for tensile strength of steel 3. Perform test for ductility of steel 4. Fill in the test sheet	• Explain type of metals • Steel and its types • Explain different tests performed on steel • Procedure to calculate compressive strength of steel • Procedure to tensile strength of steel • Procedure to ductility of steel Activity: • Perform test for tensile strength of steel • Perform test for ductility of steel	Total: 19hrs Theory: 7hrs Practical: 12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker • Test sheet Non Consumable • White board • Computer • Tensile testing machine	Class Room / Lab
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Module3: Perform Inventory Management

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

Duration: 73 hours **Theory:** 49 hours **Practical:** 24 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Measure Raw material at site	The trainee will be able to: 1. Calculate quantity of materials at site 2. Check with the log register 3. Adjust demands in accordance with the available raw materials 4. Manage production plan accordingly	• Types of materials • Material characteristics • Knowledge of log register • Classification of materials according to nature of size and shape • Knowledge of production plan • Characteristics of construction materials • Principles of safe and efficient storage • Knowledge of fine and coarse aggregate Activity: • Practice of calculating the amount of material available on site. • Practice of adjusting demands in accordance with available raw material.	Total: 18hrs Theory: 12hrs Practical: 6hrs	Consumable • Notebooks • Pencils • Log register • White board marker Non Consumable • White board • Multimedia • Internet • Computer system	Class Room / Work Site

LU2: Perform the storage of materials and tools	The trainee will be able to: 1. Perform material dumping as per graded sizes 2. Check materials quality and quantity 3. Prepare material consumption report 4. Check tools quality 5. Generate incident report	• Safety stock inventory • Importance of gradation of materials • Material characteristics • Incident report and its component • Batch tracking • Material Auditing • First in First out (FIFO) • Last in First out (LIFO) Activity: • Practice of dumping material as per graded sizes. • Practice to check material quality and quantity visually as per standards. • Practice of preparing material consumption report • Practice of generating incident report in case of any accident at work site	Total:18hrs Theory:12hrs Practical:6hrs	Consumable • Notebooks • Pencils • White board marker • Material log Register Non Consumable • White board • Multimedia • Internet • Computer system	Class Room / Work site
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LU3: Maintain the Log Register	The trainee will be able to: 1. Manage log register 2. Prepare issuance checklist 3. Maintain Material borrow checklist 4. Enter data corresponding to every type of raw material 5. Audit Log register with available materials at site 6. Report to in charge in case of any issues 7. Prepare production record sheet	• Knowledge of log register • Explain production record sheet • Incident report and its component • Material stolen/lost report • Checklist for material inventory • Procedure of audit of log register • Knowledge of digital log book Activity: • Practice of maintaining log register on daily bases. • Practice of cross-checking available material with log register. • Practice of generating report in case of any deficiency.	Total: 18hrs Theory: 12hrs Practical: 6hrs	Consumable • Notebooks • Pencils • Whiteboard marker • Material log register Non Consumable • White board • Multimedia • Internet • Computer system	Class Room / Work site
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LU4: Declare Procurement Plan	The trainee will be able to: 1. Maintain supply and demand 2. Maintain zero error relationship 3. Perform future forecast of demand and supply 4. Generate purchase requisition request	• Procurement plan • Purchase requisition request • Forecasting of future demand of material • Knowledge of zero error relationship Activity: • Practice to predict future demand of material used at worksite and preparing a procurement plan for it • Practice of generating a purchase request of material required at worksite	Total: 19hrs Theory: 13hrs Practical: 6hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system	Class Room / Worksite
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Module 4: Manage and Supervise the Job Activities

Objective of the module: The aim of this module to get knowledge, skills and understanding to Manage and Supervise the Job Activities

Duration: 77 hours

Theory: 47hours

Practical: 30 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Plan for on-site operations	The trainee will be able to: 1. Consult with the client to obtain required information 2. Prepare SOPs in accordance with the identified requirements. 3. Prepare the process flow diagram in order to achieve Quality outcome. 4. Break down work of activities into small achievable components and efficient sequences 5. Recognize site hazards and the personal protective equipment (PPE) and safety procedures specified for job 6. Organize site induction for support personnel as required 7. Plan housekeeping activities prior to and post completion of work	• Differentiate principles of planning and project management • Differentiate roles and responsibilities for different levels of site supervision. • Describe the method to Plan for on-site operations Activity: • Prepare the plan of activities for a specific town planning job order including break down of activities, recognize site hazards, prepare the demand of required equipment's and man power.	Total: 21 hrs Theory: 12 hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Calculator	Class Room / Plant Site

LU2: Supervise work activities to achieve desired results	The trainee will be able to: 1. List and arrange required resources prior to commencement of work 2. Recognize the areas of work which could result in a delay of work, wastage of material or damage to tools. 3. Allocate responsibility to required team members to avoid conflicts 4. Review work plan in response to new information, urgent requests, changed situations or instructions from concern personnel 5. Cooperate with team members to achieve common goals	• Describe the information relevant to inspection activities and work document preparation for recording inspection results. • Differentiate documentation and record system of the inspection body Activity: • Practice to manage task allocation to the team member for the specific town planning survey job order, trace out the weak area of work and review the work plan.	Total: 18 hrs Theory: 12 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Survey tools	• Class Room
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LU3: Perform on- site inspection	The trainee will be able to: 1. Conduct inspection of processes & materials according to inspection plan 2. Identify defects and deficiencies in product & processes 3. Record defects and deficiencies with evidence in product & processes (if required) 4. Perform test as per standard procedure for determining the physical properties of materials and product. 5. Collect the samples of materials & products for lab testing as per standards 6. Complete the sampling document as per requirement 7. Check the actions taken for rectification of snag list 8. Record the non-compliance and expected breaches of contract as per SOPs.	• Differentiate different types of deficiencies in inspection activities • Describe site problems and recommended corrective actions • Describe the procedure Perform on- site inspection Activity: • Conduct inspection of water supply scheme with emphasis on deficiencies and defects in process. • Perform testing of water samples.	Total: 20 hrs Theory: 11 hrs Practical: 9hrs	Consumable • Notebooks • Pencils • Pipe • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Container	• Class Room
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LU4: Prepare the inspection report.	The trainee will be able to: 1. Collect and review the information relevant to inspection activities for recoding inspection results 2. Verify the integrity of information supplied by other party as a part of the inspection process 3. Record inspection observations and findings 4. Recommend the necessary corrective actions for tackling the identified problems	• Explain the awareness of environmental sustainability issues as they relate to the work task. • Explain the procedure to prepare the inspection report. Activity: • Prepare the inspection report following the standard reporting formate.	Total: 18 hrs Theory: 12 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system	• Class Room
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Module 5: Develop 3D Model using REVIT

Objective of the module: The aim of this module to get knowledge, skills and understanding to develop 3D Model using REVIT

Duration: 120

Theory: 30hours

Practical: 90 hours

hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Setup Interface	The trainee will be able to: 1. Create custom user interface as per requirement of specific trade. 2. Create and apply Families for given specifications and requirements.	• Different layouts of software for specific field. • Commands and tools. • Vocabulary and terminologies. • Annotation and detailing. Activity: • Practice of setting up custom user interface of REVIT according to the requirement • Practice of creating and applying families in REVIT as per requirement	Total: 27 hrs Theory: 6hrs Practical: 21 hrs	Consumable • Notebooks • Pencils • Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • REVIT	Class Room / Computer lab
LU2: Create building layout	The trainee will be able to: 1. Create/import drawings to make layout according to the given requirements. 2. Modify drawings and objects to meet given criteria.	• Knowledge of Import/Export. • Knowledge of Modeling techniques. • Knowledge of Materials, textures and colors. • Knowledge of 3D prototype model Activity:	Total: 33 hrs Theory: 9 hrs	Consumable • Notebooks • Pencils • Whiteboard marker	Class Room / Computer lab

	3. Create 3D prototype model of the drawing according to given measurements.	Practice of creating a layout of a single-story residential building in REVIT and creating a 3D prototype of that building	Practical: 24 hrs	Non Consumable - White board - Multimedia - Internet - Computer system - REVIT	
LU3: Create construction document	The trainee will be able to: - Create specification/detail for various parts according to given requirements. - Apply specified detail to objects according to given requirements. - Annotate the drawings using set parameters as per given details.	- Material sheet in REVIT - Annotation of drawings in REVIT - Specifications of construction objects used in REVIT Activity: Practice of making construction document of a single-story residential building in REVIT and adding specified details to objects as per requirement	Total: 27 hrs Theory: 6 hrs Practical: 21 hrs	Consumable - Notebooks - Pencils - Whiteboard marker Non Consumable - White board - Multimedia - Internet - Computer system - REVIT	Class Room / Computer lab
LU4: Render Model	The trainee will be able to: Add scene of 3D model according to specification	- Materials, textures and colors. - Cameras and navigation of 3D environment. Activity:	Total: 33 hrs	Consumable - Notebooks - Pencils	Class Room / Computer lab

	2. Add lights for illumination to get the requisite scene of 3D model. 3. Assign cameras to execute different views of 3D Model. 4. Render the 3D model according to required image size or resolution & orientation. 5. Generate material sheet	Practice of creating a 3D render image of a single-story residential building in REVIT as per requirement and generate material sheet.	Theory: 9 hrs Practical: 24 hrs	• Whiteboard marker Non Consumable • White board • Multimedia • Internet • Computer system • REVIT	
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Module6: Prepare Topographic Map by GPS

Objective of the module: The aim of this module to get knowledge, skills and understanding to prepare topographic map by GPS

Duration: 141 hours

Theory: 39hours

Practical: 102 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Set out co-ordinates by GPS	The trainee will be able to: 1. Set out GPS 2. Open Google map 3. Find your co-ordinates 4. Record coordinate location	• Basic geographical concept • Usage of grid reference and GPS • GPS and its parts • Different functions and modes of GPS • Working process of GPS • Knowledge of Google map/ Earth • Different projection systems Activity: • Practice of setting out coordinates using hand-held GPS on Google Earth software.	Total: 19hrs Theory: 6hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • Hand-held GPS • Brunton compass • Plain table	Class Room Computer lab

LU2: Set coordinates by GPS	The trainee will be able to: 1. Set out GPS 2. Use various modes 3. View profile by Google map 4. Use Processing options 5. Take 3-D, topography 6. Generate Data	• Knowledge of different parameters of GPS performing surveying & leveling and different modes Activity: • Practice of setting coordinates by GPS and generates data.	Total: 20hrs Theory: 5 hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • Hand-held GPS • Brunton compass • Plain table	Class Room
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LU3: Set out Civil Engineering Projects by GPS	The trainee will be able to: 1. Set GPS at station point 2. Select "RTK" Network Approach 3. Apply (R.T) Real Time Positioning by GPS 4. Use GPS Derived "COORDINATES" 5. Use Laser Pointing System 6. Evaluate "RTK" Accuracy Results	• Knowledge of Real Time positioning of GPS • Knowledge of Laser pointing system in GPS • Knowledge of Real Time Kinematics Activity: • Practice to set out a small commercial building project coordinates on ground using GPS	Total: 20hrs Theory: 5hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • Single frequency GPS • Brunton compass • Plain table	Class Room
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LU4: Utilize Grid Reference and GPS usage	The trainee will be able to: 1. Identify the longitude and latitude of given location 2. Locate the given site by GPS 3. Find direction by Brunton compass. 4. Identify the number of topographic sheets 5. Scale topographic sheet 6. Identify the values of longitude and latitude of given site 7. Measure distance between two specific points on topographic sheet	• Define longitude and latitude of location • Define single and dual frequency GPS • Define Brunton compass • Define topography • How to measure distance between two specific points of topographic region Activity: • Reading map as per GPS reference location • Find direction by using Brunton compass • Calculate longitude and latitude of given site • Measure distance between two specific points on topographic sheet	Total: 20hrs Theory: 5hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • D/GPS • Brunton compass • Plain table	Class Room
LU5: Illustrate Administrative Index	The trainee will be able to: 1. Identify manmade and natural features on topographic sheets	• Define geographical location of topographic sheet • Explain Administrative index • Explain man-made and natural features	Total: 18hrs Theory: 6hrs	Consumable • Notebooks • Pencils • White board marker	Class Room

	2. Identify geographical boundaries of different administrative zones on topographic sheet	Activity: • Identify man-made and natural features on topographic sheets • Identify geographical boundaries of different administrative zones on topographic sheets	Practical: 12 Hrs	Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • GPS • Brunton compass • Plain table	
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LU6: Locate Specific Area in Sheet	The trainee will be able to: 1. Calculate area of project site on topographic map 2. Calculate excavation area of required location	• Knowledge of calculating area of housing scheme on topographic sheet • Knowledge calculating excavation area on sheet Activity: • Practice to calculate area of a housing society on topographic sheet • Practice to calculate excavation area for sewerage line layout of required location	Total: 21hrs Theory: 6hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • GPS • Brunton compass • Plain table	Class Room
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LU7: Set out Legends of Topographic Sheet	The trainee will be able to: 1. Identify the natural and man-made features on topographic sheet 2. Identify water bodies, vegetation cover, agricultural land, mountainous and plain area 3. Identify man-made structures 4. Identify the landforms by reading contours	• Knowledge of natural and manmade features on topographic sheet • Understanding of water bodies • Knowledge of contours • Knowledge of benchmarks Activity: • Practice to identify landforms by reading contours • Practice to identify geomorphologic features on topographic sheets	Total: 21hrs Theory: 6hrs Practical: 15 Hrs	Consumable • Notebooks • Pencils • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Topographic sheet • GPS • Brunton compass • Plain table	Class Room
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Module 7: Apply ArcGIS and Google Earth in Urban Area Management

Objective of the module: The aim of this module to get knowledge, skills and understanding to apply ArcGIS and google earth in urban area management

Duration: 104 hours **Theory:** 20 hours **Practical:** 84 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Use of Google Earth	The trainee will be able to: 1. Setup Google earth as per job requirements 2. Access the location of the given area 3. Manipulate the coordinates as required 4. Calculate the area of the given site 5. Calculate the distance between different points	• Installation of Google Earth Application • Knowledge of commands of Google earth software • Knowledge of Bitmap • Knowledge of landmarks • Procedure of calculating area in Google earth • Procedure of exporting files in Google earth Activity: • Mark and calculate the area of any given city of Pakistan on Google earth • Identify and mark historical landmark on a given area on Google Earth and export the file	Total:30hrs Theory:06hrs Practical:24hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Computer • Internet • Google Earth	Classroom / Computer lab

LU2: Apply Geo referencing in ArcGIS	The trainee will be able to: 1. Upload map sheet as required 2. Assign coordinate system to uploaded sheet 3. Apply different commands in GIS as per requirement	• Concept of mapping • Installation of Arc GIS software • Uploading of map sheet • Basic commands of ArcGIS • Knowledge of GIS analysis • Types of file format used in ArcGIS • Knowledge of Georeferencing • Knowledge of coordinate system in ArcGIS • Knowledge of ArcMap, ArcToolbox, ArcScene, ArcCatalog, ArcGlobe and ArcGIS pro • Knowledge of .Tiff format • Knowledge of different sources of Imagery Activity: • Practice of downloading map sheet from internet source • Practice of uploading the given image in ArcGIS and performing georeferencing by setting coordinates and aligning it as per requirement	Total: 37hrs Theory: 07hrs Practical: 30hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Computer • Internet • ArcGIS	Classroom / Computer lab
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LU3: Perform analysis In ArcGIS	The trainee will be able to: 1. Select area for analysis 2. Outline the position of selected area 3. Insert layer template 4. Add data of urban features 5. Add labels to urban features 6. Export layout	• Types of GIS analysis • Knowledge of urban and rural areas • Knowledge of exporting ArcGIS file • Knowledge of shapefile layers in ArcGIS • Knowledge of Bookmark panel in ArcGIS Activity: • Identify and label urban and rural features on an historical image of 10-year-old area provided in ArcGIS	Total: 37hrs Theory: 07hrs Practical: 30hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Computer • Internet • ArcGIS	Classroom /Computer lab
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Module 8: Plan a Project in Primavera P6

Objective of the module: The aim of this module to get knowledge, skills and understanding to Plan a Project in Primavera P6

Duration: 140 hours **Theory:** 47 hours **Practical:** 93 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Perform Basic operation in Primavera P6	The trainee will be able to: 1. Load & unload primavera P6 Software. 2. Prepare interface of software 3. Customize P6 Screen Layout 4. Create WBS of project in Primavera	• Describe Physical performance to Customized screen layout • Elaborate Activity Constraints • Differentiate different types of values. • Differentiate different types of activities. • Describe the total float and free float. Activity: • Practice to perform Basic operation in Primavera P6 (Load and unload) and prepare interface customizing screen layout. • Practice to create dummy activity. • Practice to identify different types of activities.	Total: 32hrs Theory: 11hrs Practical: 21hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Primavera P6 Software	Classroom / computer Lab
LU2: Perform Project Activities	The trainee will be able to: 1. Add Project in Primavera	• Differentiate between Work calendar, work/non-work days and working hours • Differentiate between roles and Hourly Rates	Total: 36hrs Theory: 12hrs	Consumable • Notebooks • Pen	Classroom / computer Lab

Scheduling in Primavera P6	2. Create Activities of project in Primavera. 3. Create Relationships between activities of project in Primavera. 4. Create Schedule of activities of project in Primavera. 5. Display Gantt Chart	• Describe the CPM (Critical Path Method). • Describe the procedure to draw the activity diagram for CPM. • Describe to calculate the activity time and job critical time. • Describe procedure to prepare Gantt chart. Activity: • Practice to add project in Primavera P6 and creating its work break down structure (WBS) • Practice of creating activities and the relation between activities of project in Primavera P6. • Practice of creating schedule of activities Primavera P6. • Practice to draw the activity diagram for CPM. • Practice to prepare Gantt chart.	Practical: 24hrs	• White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Primavera P6 Software	
LU3: Perform Project Resources Costing & Planning in Primavera P6	The trainee will be able to: 1. Add constraints of activities of project in Primavera. 2. Create Calendar for activities of project in Primavera. 3. Assign Calendars to	• Explain baselines and describe their use in evaluating project performance • Explain the stages of project execution Activity: • Practice of adding constraints, creating and assigning calendar to	Total:36hrs Theory:12hrs Practical:24hrs	Consumable • Notebooks • Pen • White board marker	Classroom / computer Lab

	activities of project in Primavera. 4. Add Resources to activities of project in Primavera. 5. Assign Resources of activities of project in Primavera. 6. Add Cost of activities of project in Primavera. 7. Analyze Resources of activities of project in Primavera. 8. Perform Baseline process for Project.	the activities in Primavera P6 • Practice of adding and assigning resources of activities in Primavera P6 • Practice of adding cost of activities in Primavera P6 • Practice of performing baseline process of project.		Non Consumable • White board • Multimedia • Internet • Computer system • Primavera P6 Software	
LU4: Manage Project in Primavera P6	The trainee will be able to: 1. Status the Project 2. Mitigate the schedule	• Describe the project monitoring and control • State the status of the project. Activity: • Practice to prepare mitigate chart • Practice to update project schedule in Primavera P6	Total:36hrs Theory:12hrs Practical:24hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Internet • Computer system • Primavera P6 Software	Classroom / computer Lab

Module 9: Develop entrepreneurial skills

Objective of the module: The aim of this module to get knowledge, skills and understanding to develop entrepreneurial skills

Duration: 60 hours **Theory:** 36 hours **Practical:** 24 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU 1 Develop a business plan	The trainee will be able to: 1. Conduct a market survey to collect information 2. Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses 3. Compile the information collected through the market survey, in the business plan format	• Describe market survey and its tools e.g.: questionnaire, interview, observation • Explain elements of business plan • State the procedure to fill the business plan format Activity: • Conduct market survey. • Formulate business plan in terms of feasibility, investment potential and risk.	Total 16 hrs Theory: 7hrs Practical: 9 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia	• Class Room • Simulated environment

LU 2 Collect information regarding funding sources	The trainee will be able to: 1. Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate 2. Choose the best available option according to investment requirement 3. Prepare documents according to the loan agreement requirement 4. Include the information of funding sources in the business plan	• Explain different funding sources • Describe the documents required to get loan to start a new business Activity: • Prepare the documents for financial feasibility for external investment / loan for the business plan. • Prepare loan documents.	Total 13 hrs Theory: 10 hrs Practical: 3 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • White board marker Non Consumable • White board • Multimedia	• Class Room • Simulated environment
LU 3 Develop a marketing plan	The trainee will be able to: 1. Make a marketing plan for the business including product, price,	• Prepare the product promotion strategy • State elements of business plan • Describe 5 Ps of marketing	Total 15 hrs Theory: 9 hrs Practical: 6 hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners	• Class Room • Simulated environment

	placement, promotion, people, packaging and positioning 2. Include the information of marketing plan in the business plan	- Prepare human resource strategy plan. Activity: - Prepare marketing plan for proposed product		- White board marker Non Consumable - White board - Multimedia	
LU 4 Develop basic business communication skills	The trainee will be able to: - Communicate with internal customers e.g.: labor, partners and external customers e.g.: suppliers, customers etc., using effective communication skills - Use different modes of communication to communicate internally and externally e.g.:	- Describe 7Cs of business communication - Explain different modes of communication and their application in the industry - State business terms used in the industry - Describe organization's procedures and policy related to information and communication systems, protocol and procedures Activity: - Practice to prepare a report about shortage of labor	Total 16 hrs Theory: 10 hrs Practical: 6 hrs	Consumable - Notebooks - Pencils - Erasers - Sharpeners - White board marker Non Consumable - White board - Multimedia	- Class Room - Simulated environment

	presentation, speaking, writing, listening, visual representation, reading etc. 3. Use specific business terms used in the market	Practice to play a role to communicate with customer about the product.			
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Module 10: Develop Practice Professionalism

Objective of the module: The aim of this module to get knowledge, skills and understanding to practice professionalism

Duration: 240 hours **Theory:** 90 hours **Practical:** 150 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Develop Portfolio for industry	The trainee will be able to: 1. Select previous assignments for portfolio 2. Work on previous selected assignments for portfolio 3. Compile variety of assignments for portfolio 4. Make Professional Portfolio for industry 5. Develop Digital Portfolio for industry	• Importance and necessity of portfolio • Professional portfolio Activity: • Prepare the portfolio for industry	Total:105hrs Theory:45hrs Practical:60hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Internet • Computer system	Industry/ Office

LU2: Perform Internship	The trainee will be able to: 1. Prepare internship for • Personal Presentation • Portfolio Presentation 2. Interview preparation 3. Demonstrate Ethics for Internship 4. Identify Industry for internship 5. Perform Internship in Industry • Fill the Performa of Internship • Report the performance of internship	• Ethics for Internship • Performance report Activity: • Prepare detailed report of internship	Total: 135hrs Theory: 45hrs Practical: 90hrs	Consumable • Notebooks • Pen • White board marker Non Consumable • White board • Multimedia • Internet • Computer system	Industry/Office
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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 Manager 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 Urban Area Manager 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 10modules:

- **Module 1:** Perform Sampling of Construction Materials
- **Module 2:** Perform Material Testing
- **Module 3:** Perform Inventory Management
- **Module 4:** Manage and Supervise the Job Activities
- **Module 5:** Develop 3D Model using REVIT
- **Module 6:** Prepare Topographic Map by GPS
- **Module 7:** Apply ArcGIS and Google Earth in Urban Area Management
- **Module 8:** Plan a Project in Primavera P6
- **Module 9:** Develop Entrepreneurial Skills
- **Module 10:** Practice Professionalism

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.	Primavera P6 software	26
2.	Ball peen Hammer	1
3.	Board of Safety instructions	1
4.	Computers	1
5.	Digital Balance	1
6.	Face mask	1
7.	Fire Buckets	10
8.	Fire Extinguishers	10
9.	First aid Kit	10
10.	Grip pliers	10
11.	Safety gloves	10
12.	Hand hacksaw with blade	10
13.	Briquette apparatus	5
14.	Le-Chatlier apparatus	5
15.	Sieve set	5
16.	Flakiness apparatus	5
17.	Elongation apparatus	5

18.	Cone for slump test	5
19.	UTM (Universal Testing Machine)	5
20.	Log Book	5
21.	Jack Hammer	5
22.	Nose Pliers	5
23.	Steel rule	10
24.	Tweezers	5
25.	Aggregate impact value test machine	2
26.	Metallic tray	5
27.	Ellen Key	5
28.	Fire extinguishers	5 each
29.	PPEs	2
30.	Digital Balance	5
31.	Chisel	5
32.	Topographic sheet	5
33.	Plain table	5
34.	Hand-held GPS	5
35.	D/GPS	
36.	ArcGIS software	5
37.	Brunton Compass	5
38.	Google Earth	5

39.	Sampling Containers	5
40.	Ziplock bags	5
41.	Alcohol wipes	5 each
42.	Internet	10
43.	REVIT software	25
44.	Plate bearing test equipment	10
45.	Rebound Hammer	10

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. Perform Sampling of Construction Materials	99	9.9
B. Perform Material testing	146	14.6
C. Perform Inventory management	73	7.3
D. Manage and Supervise the Job Activities	77	7.7

Competency Standard	Estimate of hours	Credit
E. Develop 3D Model using REVIT	120	12.0
F. Prepare Topographic Map by GPS	141	13.9
G. Apply ArcGIS and Google Earth in Urban Area Management	104	10.4
H. Plan a Project in Primavera P6	140	14
I. Develop Entrepreneurial Skills	60	6.0
J. Practice Professionalism	240	24

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:

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2.	Mr. Shahzad Ahmad	Coordinator	Deputy Director NAVTTC, Islamabad
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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