Curriculum
For
"Environmental Technology"

(Assistant Environmental Technician)

(Level -3)

07th to 11th November 2022

NAVTTC
LEARN RISE SHINE

National Vocational & Technical Training Commission

Table of Contents

Introduction

Definition/Description of the training programme for *Environmental Technology*

Environmental technology refers to the field of science concerned with reducing the human impact on the environment through technological advances or improvements. Some common applications of environmental technology deal with reducing energy consumption, limiting man-made damage to the physical environment, and reducing waste. Areas of research in the field may involve cleaner energy sources, improved energy efficiency in transportation and buildings, and methods that decrease or prevent pollution. This is a broad field that draws on many sciences, some of which include chemistry, ecology, and biology. Innovation and advances in environmental science may have commercial applications, save money, or be designed to meet government regulations.

One focus of environmental technology is on finding, using, and developing clean sources of energy that have a limited impact on the natural environment. The use of fossil fuels in electricity production transportation is not only responsible for releasing particulate matter known as smog, but also for emitting carbon dioxide. According to the United States government and others, carbon dioxide is a greenhouse gas and pollutant with the potential to harm human health through climate change. So-called alternative energy sources could reduce pollution, including air pollutants like carbon dioxide.

Basic economic factors are often a spur to advances in environmental technology. This is due in part to the fact that cost-saving solutions are usually the most efficient. Cost increases of fuels such as gasoline, for instance, have led to technology aimed at reducing fuel consumption. Advances in automobile fuel efficiency lower fuel costs while reducing harmful emissions. Many countries have vehicle efficiency regulations that were originally developed to conserve energy and keep fuel prices low but also help combat pollution problems like smog.

The main purpose of this course is to enable the student to play his/her vital role in Environmental Technology through modern knowledge driven approach.

In short, the main objective of this project is to equip the students with knowledge and skills so that they could be able to handle the issues related with rational use of inputs, minimize the economic cost and can help to enhance competencies to promote Environmental

Technology. The effort of new curriculum development by NAVTTC will help the Environmental of Pakistan to hire trained and skilled experts that will contribute in the improvement of Environmental Technology.

A first-hand experience of technological approaches to impact management, through field site visits where particular technologies are in use, is a feature of the course. Aspects of the economic and legislative issues related to the management of the environment and the use of technologies will also be covered in this course.

Purpose of the Training Programme

The purpose of this qualification (set of four occupations) is to set professional standards for Environmental Technology and to train the unskilled workers (men and women) across the country. The skilled labors will serve as key elements to improve the Environment using Technologies. Upon successful completion of this course the trainees should be able to know the basic and specific objectives of these qualifications are as under:

- Improve the professional competence regarding Environmental Technology
- Capacitate the local community and trainers in modern Competency Based Training (CBT)
- Provide flexible pathways and progressions in Environmental Technology
- Enable the trainees to perform their duties in efficient manner
- Establish a standardised and sustainable system of training on Environmental Technology in Pakistan
- Understand the issues related to Environment
- Know the relevant industry stakeholders & their role

Overall Objectives of Training Programme

The primary objective of this training program is to provide the trainees with updated knowledge and skills required for Environmental Technology to cope the challenges of the field. After qualifying the course at different levels (Level 1 – 5), the students will be able to get job in the relevant sector and also be able to perform as entrepreneurs. The contents of the course are specifically designed in such a way that it covers all the major Environmental Technology aspects hence, the students are sufficiently exposed to operational requirements of this sector and are ready to perform their duties confidently.

The main objectives of this project are to:

- Improve the quality of training delivery and setting national benchmarks for training of Environmental technology (Level 1-5) at national level.
- Provide progressive and flexible learning environment for trainees.
- Provide basics for competency-based assessment.
- Establish a standardized and sustainable training system.

Competencies to Be Gained After Completion Of Course

- **A-** Observe Workplace Ethics
- **B-** Perform Basic Computer Operations
- **C-** Exercise Basic Concepts of Environmental Technology
- **D-** Collect/Prepare Samples for Analysis
- **E-** Assist in Laboratory and Field Operations
- **F-** Assist in Maintenance of Equipment
- **G-** Maintain Routine Record

Possible Available Job Opportunities Available Immediately and Later In The Future

- Assistant Environmental Technician
- Assistant Technician
- Environmental Lab Assistant
- Assistant Maintenance Technician
- Store Assistant
- Warehouse Assistant
- Assistant Environmental Inspector

Trainee Entry Level

For National Vocational Certificate Level-2 in Environmental Technology, the entry requirement is Matriculation or equivalent to Matriculation.

Minimum Qualification of Trainer

Teaching staff should have DAE with two years' experience or 2 years Certificate with two years' experience in relevant field. They should also hold or be working towards a formal teaching qualification.

Other formal qualifications in the relevant field of Environmental Technology would be useful in addition to the above.

Recommended Trainer: Trainee Ratio

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

Medium of Instruction i.e. Language of Instruction

Instruction will be Urdu, English or Regional Language.

Duration of the Course (Total Time, Theory & Practical Time)

This curriculum comprises 09 modules. The recommended delivery time is 600 hours. Delivery of the course could therefore be full time, 5 days a week. Training providers are at liberty to develop other models of delivery, including part-time and evening delivery.

The full structure of the course is as follow:

Module	Theory[1] Days/hours	Workplace[2] Days/hours	Total hours
Module 1: Observe Workplace Ethics	10	30	40
Module 2: Perform Basic Computer Operations	20	30	50
Module 3: Exercise/Apply Basic Concepts of Environmental Technology	20	60	80
Module 4: Collect/Prepare Samples for Analysis	20	100	120
Module 5: Assist in Laboratory and Field Operations	20	90	110
Module 6: Assist in Maintenance of Equipment	20	100	120
Module 7: Maintain Routine Record	20	60	80

Summary of Competency Standards

The proposed curriculum is composed of 23 cores along with generic modules that will be covered in 3600 hrs. It is proposed that the course will be delivered in three years period (Level 1-5). The distribution of contact hours (practical & theory) is given below:

- **Theory:** (20%)   **Practical** (80%)
- **Theory:** 130**hours**   **Practical:** 470 **hours**

---

[1]   Learning Module hours in training provider premises
[2]   Training workshop, laboratory and on-the-job workplace

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 standardised 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:

Technician - 6 Months		
Module 1: Observe Workplace Ethics-I **40 Hours**		**Module 3:** Exercise/Apply Basic Concepts of Environmental Technology **80 Hours**
Module 4: Collect/Prepare Samples for Analysis **120 Hours**		
Module 5: Assist in Laboratory and Field Operations **110 Hours**	**Module 6:** Assist in Maintenance of Equipment **120 Hours**	
Module 2: Perform Basic Computer Operations **50 Hours**		
Module 7: Maintain Routine Record **80 Hours**		

Summary – Overview of the Curriculum

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 1: Observe Workplace Ethics-I **Aim:** After successful completion of this module, the trainee is competent in Observing Workplace Ethics-I	**LU1:** Ensure discipline at workplace **LU2:** Promote culture of integrity at workplace	10	30	40
Module 2: Perform Basic Computer Operations **Aim:** After successful completion of this module, the trainee is competent in performing Basic Computer Operations	**LU1:** Configure Computer System **LU2:** Create a Document using MS Word **LU3:** Preparer a Worksheet using MS Excel **LU4:** Prepare a presentation using MS PowerPoint	10	40	50

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 3: Exercise/Apply Basic Concepts of Environmental Technology **Aim:** After successful completion of this module, the trainee is competent in Exercise/Apply Basic Concepts of Environmental Technology	**LU1:** Identify various forms of energy **LU2:** Identify different sources of energy **LU3:** Identify basic National Environmental Quality Standards (NEQS)	20	60	80
Module 4: Collect/Prepare Samples for Analysis **Aim:** After successful completion of this module, the trainee is competent in Collecting/Preparing Samples for Analysis	**LU1:** Identify samples to be collected **LU2:** Collect samples **LU3:** Prepare samples	20	100	120

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 5: Assist in Laboratory and Field Operations **Aim:** After successful completion of this module, the trainee is competent in Assisting in Laboratory and Field Operations	**LU1:** Prepare for work **LU2:** Prepare reagents **LU3:** Collect data for operational report	20	90	110
Module 6: Assist in Maintenance of Equipment **Aim:** After successful completion of this module, the trainee is competent in Assisting in Maintenance of Equipment	**LU1:** Identify faults **LU2:** Perform routine maintenance of equipment **LU3:** Collect data for maintenance report	20	100	120

Module Title and Aim	Learning Units	Theory Days/hours	Workplace Days/hours	Timeframe of modules
Module 6: Maintain Routine Record **Aim:** After successful completion of this module, the trainee is competent in Maintaining Routine Record	**LU1:** Maintain record of inventory **LU2:** Maintain record of operations and maintenance	20	60	80

Modules

Module 1: Observe Workplace Ethics-I

Objective of the module: This unit describes the skills and knowledge required to Observe Workplace Ethics-I. This will help to build trainees character, required to meet the standard core values of any organization.

Duration: 20hours **Theory:** 10 hours **Practical:** 10 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Ensure discipline at workplace	**The trainee will be able to:** 1. Follow work ethics as per company policy 2. Follow SOPs for working on site 3. Ensure punctuality and dedication 4. Treat everyone with respect	• Work Ethics • SOPs for working on site • Importance of punctuality and dedication	**Total:** 05hrs **Theory:** 02hrs **Practical:** 02hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	Class room
LU2: Promote culture of integrity at workplace	**The trainee will be able to:** 1. Identify core values of human relationship in an organization	• Core values of human relationship in an organization	**Total:** 05hrs **Theory:** 02hrs **Practical:** 02hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable	Class room

	2. Practice integrity for understanding positive culture 3. Practice self-accountability information			• White board • Multimedia • Internet • Computer system • PPEs

Module 2: Perform Basic Computer Operations

Objective of the module: After successful completion of this module, the trainee is competent in performing Basic Computer Operations.

Duration: 50 hours   **Theory:** 10 hours   **Practical:** 40 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1. Configure Computer System	**The trainee will be able to:** 1. Connect computer components and peripherals as per requirement. 2. Install Drivers and applications according to the software specification. 3. Troubleshoot Applications to trace and fix faults in a specific application to bring it in a running condition.	• Introduction to hardware and software • Introduction to configuring computer • Install and Configure a Computer System • Introduction to troubleshooting • Types of troubleshooting	**Total:** 07hrs **Theory:** 03hrs **Practical:** 04hrs	Consumable • Pocket files • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	Class room/Computer Lab
LU2. Create a Document using MS Word	**The trainee will be able to:** 1. Compose a document as per the requirement. 2. Format Word Document according to given requirements. 3. Print Word Documents	• Introduction to MS Word • Creating a file in MS Word • Uses of Templates in MS Word • File and types of files	**Total:** 14hrs **Theory:** 02hrs **Practical:** 12hrs	Consumable • Pocket files • Notebooks • Pencils • Erasers • Sharpeners	Class room/Computer Lab

				Non Consumable • White board • Multimedia • Internet • Computer system	
	according to requirements.	• Creating and printing different documents in MS Word			
LU3. Prepare a Worksheet using MS Excel	**The trainee will be able to:** 1. Develop a worksheet as per given data. 2. Format the worksheet according to given criteria. 3. Apply Formulas according to the requirement. 4. Generate Charts/Graphs according to the given data.	• Introduction to MS Excel • Creating a worksheet in MS Excel • Uses of Templates in MS Excel • Formulas for calculations • Adding Graphs in MS Excel sheet • Creating and printing different documents in MS Excel	**Total:** 14hrs **Theory:** 02hrs **Practical:** 12hrs	Consumable • Pocket files • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	Class room/Computer Lab
LU4. Prepare a presentation using MS PowerPoint	**The trainee will be able to:** 1. Insert Slides with different Layouts according to requirements of presentation. 2. Insert text, tables, images, etc. according to the	• Introduction to MS PowerPoint • Creating a presentation in MS PowerPoint • Uses of Templates in MS PowerPoint	**Total:** 15hrs **Theory:** 03hrs **Practical:** 12hrs	Consumable • Pocket files • Notebooks • Pencils • Erasers • Sharpeners Non Consumable	Class room/Computer Lab

	requirement. 3. Apply a set of effects to animate the slide according to requirement. 4. Apply Slide Transitions on Slides according to requirement. 5. Apply Sound Effects on Objects/text/images according to requirement. 6. Present a presentation according to 7Cs of communication.	• Setting the transitions for slides • Presentation of slides		• White board • Multimedia • Internet • Computer system	

Module 3: Exercise Basic Concepts of Environmental Technology

Objective of the module: After completing this module, the learner will be able to Apply Basic Concepts of Environmental Technology.

Duration: 60 hrs.   **Theory:** 24 hrs.   **Practical:** 36 hrs.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place

LU1: Identify various forms of energy	**The trainee will be able to:**
	
	1. Interpret concepts of different forms of energy, such as:
	  o Kinetic energy (electrical, radiant and thermal etc.)
	  o Potential energy (mechanical, nuclear, chemical and gravitational etc.)
	2. Perform inter-conversion of energy
		• Basic Concepts of Environmental Technology
		• Identify basic National Environmental Quality Standards (NEQS)
		
		• Forms of energy
		  o Kinetic energy
		  o Potential energy
		• Inter conversion of energy
		
		Practical Activity:
		1. Classify different forms of energy
		2. Perform inter-conversion of energy
			Total: 30hrs
			Theory: 12hrs
			Practical: 18hrs
				Consumable
				• Notebooks
				• Pencils
				• Erasers
				• Sharpeners
				Non Consumable
				• White board
				• Multimedia
				• Internet
				• Computer system
					Class Room/ Site Specific Field Area

LU2: Identify different sources of energy	The trainee will be able to: 1. Interpret the concept of renewable energy sources such as: solar, biomass, hydropower, wind and geothermal, tidal etc. 2. Interpret the concept of non-renewable energy sources such as coal, natural gas, nuclear and fossil fuels	• Sources of energy (Renewable and Non-renewable) • Importance of renewable and non-renewable energy sources **Practical Activity:** 1. Differentiate between Renewable and Non-renewable energy sources	**Total:** 30hrs **Theory:** 12hrs **Practical:** 18hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system • Calculator	Class Room/ Site Specific Field Area

Module 4: Collect/Prepare Samples for Analysis

Objective of the module: After completing this module, the learner will be able to Collecting/Preparing Samples for Analysis which include comprehensive knowledge of Prepare for work, Prepare reagents and Collect data for operational report by using appropriate method.

Duration: 120 hrs.   **Theory:** 21 hrs.   **Practical:** 99 hrs.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Identify samples to be collected	**The trainee will be able to:** 1. Identify sources of sample such as air, water and soil 2. Identify area of sample source 3. Identify the purpose of sample to be analyzed 4. Identify possible hazard and risks related to sample source	• Importance of sampling as per given instructions • Sources of sample (air, water and soil) • Types of sample • Possible hazard and risks related to sample source **Practical Activity:** 1. Enlist possible hazard and risks related to sampling.	**Total:** 18hrs **Theory:** 3hrs **Practical:** 15hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment for sampling Non Consumable • White board • Multimedia • Internet • Computer system • PPEs	Class Room/ Site Specific Field Area

LU2: Collect samples	The trainee will be able to: 1. Use PPEs before collecting samples 2. Select appropriate tools and equipment for sample collection 3. Collect the required sample as per standards 4. Perform labeling of collected sample as per set standards 5. Transport the stored samples as per SOPs	• Sampling methods • Tools and equipment required for sampling • Sample preservation methods **Practical Activity:** 1. Collect representative samples as per instructions	**Total:** 51hrs **Theory:** 9hrs **Practical:** 42hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment for sampling • Acids and Bases Non Consumable • White board • Multimedia • Internet • Computer system • PPEs	Class Room/ Site Specific Field Area
LU3: Prepare samples	The trainee will be able to: 1. Check the requirement for sample analysis 2. Process the collected sample to required form	• Purpose of sampling • Pre-treatment Processes of collected sample • Importance of labelling samples	**Total:** 51hrs **Theory:** 9hrs **Practical:** 42hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners	Class Room/ Site Specific Field Area

3. Label the collected sample as per set standards	**Practical Activity:** **1.** Process the collected sample as per given instructions		• Lab equipment for sampling • Acids and Bases Non Consumable • White board • Multimedia • Internet • Computer system • PPEs

Module 5: Assist in Laboratory and Field Operations

Objective of the module: After completing this module, the learner will be able to assisting in Laboratory and Field Operations which include comprehensive knowledge to identify faults, Perform routine maintenance of equipment and Collect data for maintenance report.

Duration: 110 hrs.   **Theory:** 14 hrs.   **Practical:** 96 hrs.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Arrange the tools and materials	**The trainee will be able to:** 1. Identify the available materials and equipment 2. Check the specific requirement of survey site or procedure 3. Inspect the available materials and equipment before use 4. Identify SOPs/manual to use materials and equipment 5. Arrange tools/equipment as per job requirement	• Materials and equipment • Importance of inspecting the materials and equipment before use • Arranging tools/equipment as per requirement **Practical Activity:** 1. Arrange tools/equipment according to requirement	**Total:** 14hrs **Theory:** 2hrs **Practical:** 12hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment • Glasswares Non Consumable • White board • Multimedia • Internet • Computer system • PPEs	Class Room/ Site Specific Field Area

LU2: Prepare Reagents for analysis	The trainee will be able to: 1. Use PPEs as per standard recommendations 2. Follow Standard Operating Procedures (SOPs) for preparation of required reagents 3. Inspect the prepared Reagents and equipment before use 4. Label and store the prepared reagents	• Inspection of the prepared Reagents and equipment before use • Labelling of the prepared Reagents • Methods to store the prepared Reagents **Practical Activity:** 1. Label and store the Reagents as per given instructions	**Total:** 48hrs **Theory:** 6hrs **Practical:** 42hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment • Glasswares • Acids and Bases Non Consumable • White board • Multimedia • Internet • Computer system • PPEs	Class Room/ Site Specific Field Area
LU3: Collect data for Report	The trainee will be able to: 1. Identify the suitable site for data collection	• Site selection to collect data • Types of data	**Total:** 48hrs **Theory:** 6hrs **Practical:** 42hrs	Consumable • Notebooks • Pencils	Class Room/ Site Specific Field Area

| | | 2. Choose the appropriate data
3. Take physical evidences of data
4. Mark the collected data
5. Forward the saved data to the concerned person | **Practical Activity:**
1. Identify the site, take physical evidences and mark the collected data as per given instructions | | • Erasers
• Sharpeners
• Lab equipment
• Glasswares
Non Consumable
• White board
• Multimedia
• Internet
• Computer system
• PPEs | |

Module 6: Assist in Maintenance of Equipment

Objective of the module: After completing this module, the learner will be able to assisting in Maintenance of Equipment which include comprehensive knowledge Identify faults, Perform routine maintenance of equipment and Collect data for maintenance report.

Duration: 110 hrs.   **Theory:** 20 hrs.   **Practical:** 90 hrs.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Identify faults	**The trainee will be able to:** 1. Inspect the equipment to identify the fault 2. Use PPEs as per standard recommendation 3. Label the out of order equipment 4. Report the faulty equipment to concerned authority	• Inspection of equipment to identify faults • Importance of reporting faulty equipment **Practical Activity:** 1. Inspect given equipment and enlist identified faults	**Total:** 27hrs **Theory:** 6hrs **Practical:** 21hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment for sampling • Filters • Sand papers Non Consumable • White board • Multimedia • Internet • Computer system • PPEs • Maintenance tools	Class Room/ Site Specific Field Area

LU2: Perform routine maintenance of equipment	The trainee will be able to: 1. Identify the required resources for routine maintenance 2. Check the calibration status of equipment 3. Perform maintenance of equipment as required 4. Verify the proper working of equipment 5. Maintain Log book	• Importance of calibration • Maintenance of equipment • Maintenance of Log book **Practical Activity:** 1. Check the calibration status of given equipment and perform maintenance as per requirement	**Total:** 56hrs **Theory:** 8hrs **Practical:** 48hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners • Lab equipment for sampling • Filters • Sand papers Non Consumable • White board • Multimedia • Internet • Computer system • PPEs • Maintenance tools	Class Room/ Site Specific Field Area
LU3: Collect data for maintenance report	The trainee will be able to: 1. Use the checklist for routine maintenance	• Data collection for maintenance report • Report preparation	**Total:** 27hrs **Theory:** 6hrs **Practical:** 21hrs	Consumable • Notebooks • Pencils	Class Room/ Site Specific Field Area

	2. Collect evidence(s) of required maintenance of the equipment 3. Verify the collected evidence(s) of maintenance	**Practical Activity:** 1. Prepare a maintenance report as per given instructions/data		• Erasers • Sharpeners • Lab equipment for sampling • Filters • Sand papers Non Consumable • White board • Multimedia • Internet • Computer system • PPEs • Maintenance tools	

Module 7: Maintain Routine Record

Objective of the module: After completing this module, the learner will be able to assisting in Maintenance of Equipment which include comprehensive knowledge Identify faults, Perform routine maintenance of equipment and Collect data for maintenance report.

Duration: 80 hrs.   **Theory:** 17 hrs.   **Practical:** 63 hrs.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Maintain record of inventory	**The trainee will be able to:** 1. Understand Standard Operating Procedures (SOPs) for inventory management 2. Identify concerned list of inventory 3. Inspect 'In' and 'Out' of the material from the store 4. Record details of the material issued or received 5. Coordinate with other relevant departments for material demand and issuance 6. Follow basic inventory management concepts like First In First Out	• Explain Inventory management • Describe the types of Inventory and its categories • Inventory Layers (LIFO, FIFO and FEFO) • Describe the purpose of different inventory reports **Practical Activity:** 1. Develop a sheet to maintain records as per inventory layers	**Total:** 39hrs **Theory:** 9hrs **Practical:** 30hrs	Consumable • Notebooks • Pencils • Erasers • Sharpeners Non Consumable • White board • Multimedia • Internet • Computer system	Class Room/ Site Specific Field Area

LU2: Maintain record of operations and maintenance	The trainee will be able to:
	 1. Identify relevant types and frequency of records
	 2. Inspect routine operations for record keeping
	 3. Check routine and planned maintenance for record keeping
	 4. Store collected records according to Standard Operating Procedure (SOP)
	 5. Identify the retention process and time of record (document)
		• Types and frequency of records
		    o Routine and planned maintenance
		    o Operational and maintenance emergency
		 • Retention process and time of record (document)
		
		 Practical Activity:
		 1. Prepare a list of records and mention retention time accordingly
			Total: 41hrs
			 Theory: 8hrs
			 Practical: 33hrs
				Consumable
				 • Notebooks
				 • Pencils
				 • Erasers
				 • Sharpeners
				 Non Consumable
				 • White board
				 • Multimedia
				 • Internet
				 • Computer system
					Class Room/ Site Specific Field Area

The table above continues from a previous cell showing:
(FIFO), First Expire First Out (FEFO), Last In First Out (LIFO) etc.

General assessment guidance for *Environmental Technology*

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 Pesticides& Fertiliser Technology include:

- Work performances, for example communication at workplace, application of work health and safety practices (WHS), performing basic computer operations, and identification of and implement Workplace Policies and Procedures.
- Demonstrations, for example Assist in Maintenance of Equipment
- Direct questioning, where the assessor would ask the student how to Observe Workplace Ethics-I

- Paper-based tests, such as multiple choice or short answer questions on Maintain Routine Record
- Indirect assessment is the method used where the performance could not be watched and evidence is gained indirectly.

Examples for indirect assessment of an Environmental Technology include:

- Perform Collect/Prepare Samples for Analysis

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 Collect/Prepare Samples for Analysis Tasks are to be assessed and certificated, the assessment should involve performance criteria that are directly related to that documentation activity. An interview about the Collect/Prepare Samples for Analysis Tasks 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 *Assistant Environmental Technician*

This curriculum consists of 07 modules:

- **Module 1:** Observe Workplace Ethics-I
- **Module 2:** Perform Basic Computer Operations
- **Module 3:** Exercise/Apply Basic Concepts of Environmental Technology
- **Module 4:** Collect/Prepare Samples for Analysis
- **Module 5:** Assist in Laboratory and Field Operations
- **Module 6:** Assist in Maintenance of Equipment
- **Module 7:** Maintain Routine Record

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.

Complete List of Tools and Equipment

Sr no	Description	Quantity
1	Computer with relevant software and internet	26
2	Printer	1
3	Multi media	1
4	Whiteboard	1

List of Consumable Supplies

Sr no	Material	Quantity
1.	Note books	25
2.	Eraser	25
3.	Pencils	25
4.	Sharpener	25
5.	White Board	1
6.	Board markers	15
7.	Dusters	5
8.	Cleaning solutions	-
9.	Disinfecting chemicals	-

10.	Sprayer	25
11.	Mops	25
12.	Waste buckets	5
13.	Cleaning brush	25
14.	Warning signs	-
15.	Personal Protective Equipment (PPEs)	25
16.	Air monitoring equipment (CO/CO2 monitor, SOx monitor, NOx monitor, Swab kit, Particle analyzer etc.)	1
17.	Noise Meter	5
18.	pH meter	5
19.	TDS meter	5
20.	TSS meter	5
21.	TSP meter	5
22.	DO meter	5
23.	Titration assembly	5
24.	Vibration analyzer	5
25.	Sound level meter	5
26.	Temperature gauges	5

27.	Glassware/Plastic ware	5
28.	Weighing balance	5
29.	Tags/Label	5
30.	Containers/Storage boxes	5
31.	Inventory checklist	25
32.	Emergency signs	-
33.	Emergency hooters	-
34.	First aid kit	5
35.	Fire extinguishers	5
36.	Smoke detectors	5
37.	Megaphone	3
38.	Oil spillage kit	5
39.	Survey checklist	5
40.	SOP manual	5
41.	Policy and procedure documents	25
42.	Slogans placards	25
43.	Multimedia	1
44.	PPE's	

Credit Values

The credit value of the National Certificate Level 3 in Textile Merchandizing 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	Credit	Estimate of hours
A. Observe Workplace Ethics-I	4	40
B. Perform Basic Computer Operations	5	50
C. Exercise/Apply Basic Concepts of Environmental Technology	8	80
D. Collect/Prepare Samples for Analysis	12	120
E. Assist in Laboratory and Field Operations	11	110
F. Assist in Maintenance of Equipment	12	120
G. Maintain Routine Record	8	80