

Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister's Hunarmand Pakistan Program**

"Skills for All"



**Course Contents / Lesson Plan**

**Course Title: Agriculture Soil and Water Testing**

**Duration: 6 Months**

**Revised Edition**

Trainer Name	
Course Title	<b>Agriculture Soil and Water Testing</b>
Objectives and Expectations	<p><b>Employable skills and hands-on practice for Agriculture Soil and Water Testing</b></p> <p>This course offers a broad, cross-disciplinary learning experience for students looking to pursue careers in agriculture fields like horticulture, plant protection department, urban housing schemes all disciplines that focus on effective and arresting plant health problems. The course is designed to span a wide range of pesticide and fertilizer in a digital platform.</p> <ul style="list-style-type: none"> <li>• To determine the level of availability of nutrients or the need for its introduction</li> <li>• To predict the increase in yields and profitability of fertilization (poor soils do not always provide yield increase due to fertilization because of possible limiting factors)</li> <li>• To provide the basis for calculating the required fertilizing of each crop</li> <li>• To evaluate the status (supply) of each nutrient element and simultaneously determine the compensation plan (nutrient management).</li> </ul> <p><b><u>Main Expectations:</u></b></p> <p>In short, the course under reference should be delivered by professional instructors in such a robust hands-on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion.</p> <p>This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market-centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles available out there. Moreover, they should also know the strengths and weaknesses of each trainee to prepare them for such market roles during/after the training.</p> <ol style="list-style-type: none"> <li>i. Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session, etc so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document.</li> <li>ii. To materialize the main expectations, a special module on <b><u>Job Search &amp; Entrepreneurial Skills</u></b> has been included in the latter part of this course (5<sup>th</sup> &amp; 6<sup>th</sup> month) through which, the trainees will be made aware of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favored labor destination countries also form a part of this module. Moreover, the trainees would also be encouraged to venture into</li> </ol>

self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will also be inculcated in the trainees to make them responsible citizens of the country.

- iii. A module on **Work Place Ethics** has also been included to highlight the importance of good and positive behavior in the workplace in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides +short video documentaries. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of the Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

To maintain interest and motivation of the trainees throughout the course, modern techniques such as:

- Motivational Lectures
- Success Stories
- Case Studies

These techniques would be employed as an additional training tool wherever possible (these are explained in the subsequent section on Training Methodology).

Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and a proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem-solving abilities of the trainees.

#### (i) **Motivational Lectures**

The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture. To inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey the message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees Fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity, and spark the desire needed for trainees to want to learn more.

The impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for a longer time without boredom and loss of interest because they can see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10

years).

As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

Course-related motivational lectures online link is available in **Annexure-II**.

### **(ii) Success Stories**

Another effective way of motivating the trainees is using Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.

A success story may be disseminated orally, through a presentation, or using a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication, and devotion. An inspiring success story contains compelling and significant facts articulated clearly and easily comprehensible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. The optimum impact is created when the story is revealed in the form of:-

- Directly in person (At least 2-3 cases must be arranged by the training institute)
- Through an audio/ videotaped message (2-3 high-quality videos must be arranged by the training institute)

It is expected that the training provider would collect relevant high-quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document.

Suggestive structure and sequence of a sample success story and its various shapes can be seen in **Annexure III**.

### **(iii) Case Studies**

Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real-life specific problem/situation and to explore the solutions.

In simple terms, the case study method of teaching uses a real-life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes the classroom atmosphere interesting thus maintaining the trainee interest in training till the end of the course.

Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies be presented to the trainees. The trainer may adopt a PowerPoint presentation or video format for such case studies whichever is deemed suitable but only those cases must be selected that are relevant and of a learning value.

The Trainees should be required and supervised to carefully analyze the cases. For this purpose, they must be encouraged to inquire and collect specific information/data, actively participate in the discussions, and intended solutions to

	<p>the problem/situation.</p> <p>Case studies can be implemented in the following ways: -</p> <ol style="list-style-type: none"> <li>i. A good quality trade-specific documentary ( At least 2-3 documentaries must be arranged by the training institute)</li> <li>ii. Health &amp; Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute)</li> <li>iii. Field visits( At least one visit to a trade-specific major industry/ site must be arranged by the training institute)</li> </ol>
<p><b>Entry-level of trainees</b></p>	<p>Intermediate</p>
<p><b>Learning Outcomes of the course</b></p>	<p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• To determine the level of availability of nutrients or the need for its introduction</li> <li>• To predict the increase in yields and profitability of fertilization (poor soils do not always provide yield increase due to fertilization because of possible limiting factors)</li> <li>• To provide the basis for calculating the required fertilizing of each crop</li> <li>• To evaluate the status (supply) of each nutrient element and simultaneously determine the compensation plan (nutrient management).</li> <li>• Service homes and commercial properties for outdoor pest control to ensure customers lived and worked pest free.</li> <li>• Performed general landscaping duties including fertilizer, pest control, aeration, and overall general lawn maintenance.</li> <li>• Serviced lawns, trees and shrubs, pest control around homes inside and out.</li> <li>• Addressed any customer concerns and took care of pest control issues.</li> <li>• Fertilized and sprayed lawns for pest control and management of grass.</li> <li>• Applied pest control for the presence of lawn destroying insects.</li> <li>• Identified and applied pest control needs in assigned landscape area.</li> <li>• Applied environment friendly pest control techniques in Commercial &amp; Residences</li> <li>• Spray pesticides and other pest controlling chemicals.</li> <li>• Maintained lawns through fertilization and pest control.</li> <li>• Provide Pest Control solutions and Lawn maintenance</li> <li>• Applied perimeter pest controls around houses.</li> </ul>

	<ul style="list-style-type: none"> <li>• Spray Pest control around houses.</li> </ul>
<b>Course Execution Plan</b>	<p>The total duration of the course: <b>6 months (26 Weeks)</b>  Class hours: <b>4 hours per day</b>  Theory: <b>20%</b>  Practical: <b>80%</b>  Weekly hours: <b>20 hours per week</b>  Total contact hours: <b>520hours</b></p>
<b>Companies offering jobs in the respective trade</b>	<ol style="list-style-type: none"> <li>1. Pesticide company jobs</li> <li>2. Plant protection department</li> <li>3. Research and development department</li> <li>4. PHA</li> <li>5. DHA</li> <li>6. Engro Fertilizer</li> <li>7. Fatima fertilizer</li> <li>8. FFC</li> <li>9. Ali Akbar group</li> <li>10. Soil testing laboratory</li> </ol>
<b>Job Opportunities</b>	<ul style="list-style-type: none"> <li>• Soil technician</li> <li>• Soil laboratory helper</li> <li>• Soil testing field officer</li> <li>• Extension supervisor</li> <li>• Plant protection department</li> </ul>
<b>No of Students</b>	25
<b>Learning Place</b>	Classroom / Lab
<b>Instructional Resources</b>	<p><a href="https://www.youtube.com/watch?v=mg6UoXcBkyA">https://www.youtube.com/watch?v=mg6UoXcBkyA</a> soil water basics</p> <p><a href="https://www.youtube.com/watch?v=l1wQ19WkxKY">https://www.youtube.com/watch?v=l1wQ19WkxKY</a> soil moisture content</p> <p><a href="https://www.youtube.com/watch?v=3TFY6jhArRg">https://www.youtube.com/watch?v=3TFY6jhArRg</a> soil water retention</p> <p><a href="https://www.youtube.com/watch?v=9witXco_hVw">https://www.youtube.com/watch?v=9witXco_hVw</a> pesticide solution</p> <p><a href="https://www.youtube.com/watch?v=hymNMAE91lg">https://www.youtube.com/watch?v=hymNMAE91lg</a> how to take soil sample?</p> <p><a href="https://www.youtube.com/watch?v=nRn6-KblURo">https://www.youtube.com/watch?v=nRn6-KblURo</a> how to check soil ph ?</p> <p><a href="https://www.youtube.com/watch?v=kclXO0jCVKl">https://www.youtube.com/watch?v=kclXO0jCVKl</a> soil and water testing in Pakistan</p> <p><a href="https://www.youtube.com/watch?v=cGhzyhnKi5U">https://www.youtube.com/watch?v=cGhzyhnKi5U</a> requirement of fertilizer as per sample</p> <p><a href="https://www.youtube.com/watch?v=xzGn4n-pw8I">https://www.youtube.com/watch?v=xzGn4n-pw8I</a></p>

fertigation

<https://www.youtube.com/watch?v=LojjcHkZPSY>

application techniques

## MODULES

Scheduled Weeks	Module Title	Learning Units	Remarks
Week 1	Introduction to soil	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( For further detail please see Page No: 3&amp; 4)</li> <li>• <b>Course Introduction</b></li> <li>• <b>Job market</b></li> <li>• <b>Course Applications</b></li> <li>• <b>Institute/work ethics</b></li> <li>• Introduction to soil</li> <li>• Concept of lithosphere</li> <li>• Soil as natural body</li> <li>• Soil components ( air, organic and inorganic soils )</li> <li>• Formation of soil</li> <li>• Types of soil and its basic concepts</li> </ul>	<p><b>Home Assignment</b></p> <ul style="list-style-type: none"> <li>• Task 1</li> <li>• Task 2</li> <li>• Task 3</li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 2	Properties of soil (Physical properties)	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Soil separates</li> <li>• Soil textures</li> <li>• Aggregation and structure</li> <li>• Temperature</li> <li>• Colour</li> <li>• Properties of soil mixture</li> <li>• Pore space and size</li> <li>• Bulk density</li> <li>• Particle density</li> <li>• Aeration and drainage</li> <li>• Compaction</li> <li>• Soil surface area</li> <li>• Soil water relationship</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 4</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 3	Properties of soil (Chemical properties)	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( For further detail please see Page No: 3&amp; 4)</li> <li>• morphology of colloids</li> <li>• chemistry of clays</li> <li>• ionic exchange</li> <li>• acidity and alkalinity</li> <li>• Ph</li> <li>• Salinity</li> <li>• Reactions in liming and acidification</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 5</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 4	Properties of soil (Biological	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 6</b></li> <li>• <b>Monthly</b></li> </ul>



	properties)	<ul style="list-style-type: none"> <li>• Soil organic matter</li> <li>• Carbon nitrogen relationship</li> <li>• Nitrogen transformation</li> <li>• Soil organisms</li> <li>• Sulfur transformation</li> </ul>	<b>Test 1</b>  <u>Details may be seen at Annexure-I</u>
Week 5	Fertility status of soil	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( For further detail please see Page No: 3&amp; 4)</li> <li>• Fertility status of soils</li> <li>• Soil nutrients</li> <li>• Micronutrients</li> <li>• Macronutrients</li> <li>• Their importance</li> <li>• Their sources</li> <li>• Remedial measures to overcome deficiency</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 7</b></li> </ul> <u>Details may be seen at Annexure-I</u>
Week 6	Soil profile and classification	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4)</li> <li>• Soil profile</li> <li>• Soil forming factors</li> <li>• Soil survey methods</li> <li>• Soil survey reports</li> <li>• Soil distribution</li> <li>• Classification system</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 8</b></li> </ul> <u>Details may be seen at Annexure-I</u>
Week 7	Conservation and management	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( For further detail please see Page No: 3&amp; 4)</li> <li>• Drainage</li> <li>• Soil erosion</li> <li>• Types of irrigation</li> <li>• Land use classification</li> <li>• Plant and Animal waste</li> <li>• Municipal and industrial by products and their impact</li> <li>• Nutrient loading</li> <li>• Tillage system</li> <li>• Wetlands</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 9</b></li> </ul> <u>Details may be seen at Annexure-I</u>
Week 8	Introduction to soil testing	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4) <ul style="list-style-type: none"> <li>• Sample collection and processing</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 10</b></li> <li>• <b>2<sup>nd</sup> Monthly Test</b></li> </ul>

		<ul style="list-style-type: none"> <li>• Purpose of soil testing and analysis</li> <li>• Selection of field</li> <li>• Methods of soil sample collection method</li> <li>• Methods of soil sample processing</li> <li>• Precautions during soil collection and preservation</li> <li>• Storage of soil sample</li> </ul>	<u>Details may be seen at Annexure-I</u>
Week 9	Study and Calibration of equipment	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( For further detail please see Page No: 3&amp; 4)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Explore different equipment</li> <li>• How to operate the tools and equipment</li> <li>• Process to calibrate equipment</li> <li>• Understand the importance of calibration</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 11</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>
Week 10	Soil testing equipment	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4)</li> <li>• Brief study of ph. Meter</li> <li>• Conductivity meter</li> <li>• Spectrometer</li> <li>• UV spectrophotometer</li> <li>• Kjeldahl,s method</li> <li>• Use of soil testing kit</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 12</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>
Week 11	Study of laboratory setup	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b> ( For further detail please see Page No: 3&amp; 4)</li> </ul> <p>Students are introduced to laboratory.</p> <ul style="list-style-type: none"> <li>• Laboratory layout</li> <li>• Built up area</li> <li>• Laboratory requirements</li> <li>• Working pattern</li> <li>• Budget requirement</li> <li>• Trained manpower</li> <li>• Various funding schemes and agencies</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 13</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>
Week 12	Soil test report and fertilizer recommendation	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( For further detail please see Page No: 3&amp; 4)</li> <li>• Preparation of soil analysis and test report</li> <li>• Fertilizer recommendation</li> <li>• Fertility maps</li> <li>• Preparation of soil test summaries</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 14</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>

	<b>Build your CV</b>	<p>Download professional CV template from any good site (<a href="https://www.coolfreecv.com">https://www.coolfreecv.com</a> or relevant)</p> <ul style="list-style-type: none"> <li>• Add Personal Information</li> <li>• Add Educational details</li> <li>• Add Experience/Portfolio</li> <li>• Add contact details/profile links</li> </ul>	
<b>Week 13</b>	<b>Midterm</b>		
<b>Week 14</b>	<b>Introduction to water</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> <li>• Water chemical and physical properties</li> <li>• Hydrological cycle</li> <li>• Evaporation</li> <li>• Precipitation</li> <li>• Condensation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Take 15</b> <i>Details may be seen at Annexure-I</i></li> </ul>
<b>Week 15</b>	<b>Water quality and Pollution</b>	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Quality of surface water</li> <li>• Water quality in flowing water</li> <li>• Chemical quality of drinking water</li> <li>• Microbiological quality of water</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 16</b> <i>Details may be seen at Annexure-I</i></li> </ul>
	<b>Create an account profile on Fiverr (at least two gigs) and Upwork</b>	<p>Create an account by following these steps:  Step 1: Personal Info  Step 2: Professional Info  Step 3: Linked Accounts  Step 4: Account Security</p>	
<b>Week 16</b>	<b>Properties of water</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Percolation</li> <li>• Infiltration</li> <li>• Interception</li> <li>• Transpiration</li> <li>• Runoff</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 17</b></li> <li>• <b>3<sup>rd</sup> Monthly Test</b> <i>Details may be seen at Annexure-I</i></li> </ul>

Week 17	Properties of water	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> <li>• Storage of water</li> <li>• Water resources</li> <li>• Basic outlook between surface water and ground water</li> <li>• Sea water characteristics</li> <li>• Fresh water characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 18</b> <u>Details may be seen at Annexur e-l</u></li> </ul>
Week 18	Properties of water	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture( For further detail please see Page No: 3&amp; 4)</b> <ul style="list-style-type: none"> <li>• Characteristics of brackish water</li> <li>• Water footprint</li> <li>• Drought and impacts</li> <li>• Leaching and impact</li> <li>• Flooding and impact</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 19</b> <u>Details may be seen at Annexur e-l</u></li> </ul>
Week 19	Analysis of water	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Organic analysis</li> <li>• Sample clean up and preparation</li> <li>• Equipments and its accuracy</li> <li>• Analysis by GC</li> <li>• Analysis by color-metric techniques</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 20</b> <u>Details may be seen at Annexur e-l</u></li> </ul>
Week 20	Management practices	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Ranges of recovery</li> <li>• Duplicates and spikes</li> <li>• Monitoring instrumentation</li> <li>• Calibration</li> <li>• Corrosion measurements</li> <li>• Laboratory management</li> <li>• Laboratory auditing.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 21</b></li> <li>• <b>4<sup>th</sup> Monthly test</b></li> <li><u>Details may be seen at Annexur e-l</u></li> </ul>
Week 21	<b>ADVANCED WASTEWATER TREATMENT</b>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Limitation of conventional treatment</li> <li>• Suspended solids removal</li> <li>• Chemical-biological phosphorus removal</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 22</b> <u>Details may be seen at</u></li> </ul>

		<ul style="list-style-type: none"> <li>• Biological nitrification-gentrification</li> <li>• Activated carbon adsorption</li> <li>• Membrane processes</li> <li>• Wastewater reclamation and reuse</li> </ul>	<u>Annexur e-I</u>
Week 22	Ground water management	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Watershed management</li> <li>• Ground water recharge.</li> <li>• Water quality issues</li> <li>• Recharge with storm water</li> <li>• Recharge with treated sewage.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 23</b></li> </ul> <p><u>Details may be seen at Annexur e-I</u></p>
	How to search and apply for jobs in at least two labor marketplace countries (KSA, UAE, etc.)	<ul style="list-style-type: none"> <li>• Browse the following website and create an account on each website <ul style="list-style-type: none"> <li>▪ Bayt.com – The Middle East Leading Job Site</li> <li>▪ Monster Gulf – The International Job Portal</li> <li>▪ Gulf Talent – Jobs in Dubai and the Middle East</li> </ul> </li> <li>• Find the handy ‘search’ option at the top of your homepage to search for the jobs that best suit your skills.</li> <li>• Select the job type from the first ‘Job Type’ drop-down menu, next, select the location from the second drop-down menu.</li> <li>• Enter any keywords you want to use to find suitable job vacancies.</li> <li>• On the results page you can search for part-time jobs only, full-time jobs only, employers only, or agencies only. Tick the boxes as appropriate to your search.</li> <li>• Search for jobs by: <ul style="list-style-type: none"> <li>▪ Company</li> <li>▪ Category</li> <li>▪ Location</li> <li>▪ All jobs</li> <li>▪ Agency</li> </ul> </li> <li>• Industry</li> </ul>	
Week 23	Introduction to water testing	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are advised to introduce</p> <ul style="list-style-type: none"> <li>• Introduction to water testing</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 24</b></li> </ul> <p><u>Details may be seen at</u></p>

		<ul style="list-style-type: none"> <li>• Water ph.</li> <li>• Testing of ph.</li> <li>• Electrical conductivity</li> <li>• Testing of electrical conductivity</li> </ul>	<u>Annexur e-l</u>
<b>Week 24</b>	<b>Introduction to water testing</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Total alkalinity</li> <li>• Testing total alkalinity</li> <li>• Total hardness</li> <li>• Obtaining calcium and magnesium ions</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 25</b></li> </ul> <p><u>Details may be seen at Annexur e-l</u></p>
<b>Week 25</b>	<b>Water analysis</b>	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( <i>For further detail please see Page No: 3&amp; 4</i>)</li> <li>• Calculating total hardness</li> <li>• Ammonium and nitrate testing</li> <li>• Arsenic testing</li> <li>• Cadmium testing</li> <li>• Calcium and manganese</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 26</b></li> </ul> <p><u>Details may be seen at Annexur e-l</u></p>
<b>Week 26</b>	<b>Final term</b>		

### Tasks For Certificate in Agriculture soil and water testing.

Task No.	Task	Description	Week
1.	Search successful Pakistani Soil and water technician	Search any three top fertilizer and pesticide technician in Pakistan.	Week 1
2.	Find the career path	Prepare a career path related to your course and also highlight the emerging trends in the local as well as international market	
3.	Work Ethics	Generate a report on Institute work ethics and professionalism related to your course	
4.	Visit to Soil Testing Laboratory & Report writing	<ul style="list-style-type: none"> <li>Note at least 5 physical properties of soil.</li> </ul>	Week-2
5.	Visit to Soil Testing Laboratory & Report writing	<ul style="list-style-type: none"> <li>Note at least 5 chemical properties of soil.</li> </ul>	Week 3
6.	Visit to Farmers field & Report writing.	<ul style="list-style-type: none"> <li>Take sample from field.</li> <li>Determine organic feature of soil.</li> </ul>	Week 4
7.	Visit to Farmers field & Report writing.	<ul style="list-style-type: none"> <li>Collection of Soil Samples, identification of nutrient</li> <li>Deficiency Symptoms in Crop</li> </ul>	Week 5

8.	Sample evaluation.	<ul style="list-style-type: none"> <li>Processing of Soil Sampling for analysis</li> </ul>	Week 6
9.	Visit Farmer Filed	<ul style="list-style-type: none"> <li>Visit soil tested field.</li> <li>Note management practices.</li> <li>Advice better management practices.</li> </ul>	Week 7
10.	Visit a soil testing lab.	<ul style="list-style-type: none"> <li>Note at least 5 methods of sample testing.</li> <li>Write a report on your visit.</li> </ul>	Week 8
11.	Visit a soil testing lab.	<ul style="list-style-type: none"> <li>Enlist 5 major soil testing tools and equipment.</li> <li>Learn equipment calibration.</li> </ul>	Week 9

12.	Visit a soil testing lab.	<ul style="list-style-type: none"> <li>• Use pH Meter.</li> <li>• Determination of Electrical Conductivity of Soil Sample using Electrical Conductivity meter.</li> </ul>	Week 10
13.	Visit a soil testing lab.	<ul style="list-style-type: none"> <li>• Use paper and hardboard to make a sample of laboratory setup.</li> </ul>	Week 11
14.	Antidote a preventive measure	<ul style="list-style-type: none"> <li>• Preparation of soil test report, Interpretation of result and fertilizer recommendation.</li> </ul>	Week 12
	<b>Mid Term</b>		Week 13
15.	Draw a cycle of said tasks.	<ul style="list-style-type: none"> <li>• Evaporation cycle</li> <li>• Hydrological cycle</li> <li>• Condensation cycle</li> </ul>	Week 14
16.	Visit water testing Lab	<ul style="list-style-type: none"> <li>• Note different reports of water testing.</li> </ul>	Week 15
17.	Draw a cycle of said tasks.	<ul style="list-style-type: none"> <li>• Transpiration cycle</li> <li>• Visit field and map run off losses</li> </ul>	Week 16
18.	Visit to a water storage structure.	<ul style="list-style-type: none"> <li>• Note water storage capacities of different storage bodies.</li> </ul>	Week 17
19.	Visit a drought infected area.	<ul style="list-style-type: none"> <li>• Note water disasters.</li> <li>• Also visit flooded areas.</li> <li>• Note problems due to flooding.</li> </ul>	Week 18
20.	Visit water testing Lab	<ul style="list-style-type: none"> <li>• Learn water testing techniques.</li> <li>• Perform any test.</li> </ul>	Week 19
21.	Manage your lab.	<ul style="list-style-type: none"> <li>• Manage your lab according to advance models.</li> <li>• Recover a water sample up to optimum levels.</li> </ul>	Week 20
22.	Draw a flow chart.	<ul style="list-style-type: none"> <li>• Draw a flow chart of Biological nitrification-denitrification.</li> </ul>	Week 21
23.	Visit a nearby Agricultural Field.	<ul style="list-style-type: none"> <li>• Take samples of water.</li> </ul>	Week 22
24.	Test pH and EC	<ul style="list-style-type: none"> <li>• Make records of results of pH</li> <li>• Make records of results of EC</li> </ul>	Week 23
25.	Test alkalinity and hardness of samples.	<ul style="list-style-type: none"> <li>• Make records of results of pH</li> <li>• Make records of results of EC</li> </ul>	Week 24
26.	Test Arsenic, Cadmium and calcium and manganese.	<ul style="list-style-type: none"> <li>• Record Arsenic results</li> <li>• Record Cadmium results</li> <li>• Record Calcium and Manganese</li> </ul>	Week 25
	<b>Finals</b>		Week 26



**Agriculture soil and water testing.**

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**What is E commerce and how you can make money online - BBCURDU**

<https://www.youtube.com/watch?v=9jCJN3Ff0kA>

**How to check soil ph?**

<https://www.youtube.com/watch?v=nRn6-KblURo>

**Soil and water testing in Pakistan**

<https://www.youtube.com/watch?v=kclXO0jCVKI>

**Requirement of fertilizer as per sample**

<https://www.youtube.com/watch?v=cGhzyhnKi5U>

**Success Story of a 23 Year - Old SEO Expert | How This Business Works | Urdu Hindi Punjabi**

<https://www.youtube.com/watch?v=tlQ0CWgszl0>

**Failure to Millionaire - How to Make Money Online | Fiverr Superhero Aaliyaan Success Story**

<https://www.youtube.com/watch?v=d1hocXWSpus>

## Annexure-II

### SUGGESTIVE FORMAT AND SEQUENCE ORDER OF MOTIVATIONAL LECTURE.

#### Mentor

Mentors are provided an observation checklist form to evaluate and share their observational feedback on how students within each team engage and collaborate in a learning environment. The checklist is provided at two different points: Once towards the end of the course. The checklists are an opportunity for mentors to share their unique perspective on group dynamics based on various team activities, gameplay sessions, pitch preparation, and other sessions, giving insights on the nature of communication and teamwork taking place and how both learning outcomes and the student experience can be improved in the future.

#### Session- 1 (Communication):

Please find below an overview of the activities taking place Session plan that will support your delivery and an overview of this session's activity.

Session- 1 OVERVIEW
Aims and Objectives:
<ul style="list-style-type: none"> <li>To introduce the communication skills and how it will work</li> <li>Get to know mentor and team - build rapport and develop a strong sense of a team</li> <li>Provide an introduction to communication skills</li> <li>Team to collaborate on an activity sheet developing their communication, teamwork, and problem-solving</li> <li>Gain an understanding of participants' own communication skills rating at the start of the program</li> </ul>

Activity:	Participant Time	Teacher Time	Mentor Time
Intro Attend and contribute to the scheduled.			
Understand good communication skills and how it works.			
Understand what good communication skills mean			
Understand what skills are important for good communication skills			
<b>Key learning outcomes:</b>	<b>Resources:</b>		<b>Enterprise skills developed:</b>
• Understand the	• Podium		• Communication

<p>communication skills and how it works.</p> <ul style="list-style-type: none"> <li>• Understand what communication skills mean</li> <li>• Understand what skills are important for communication skills</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Computer</li> <li>• Flip Chart</li> <li>• Marker</li> </ul>	<ul style="list-style-type: none"> <li>• Self Confidence</li> <li>• Teamwork</li> </ul>
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<b>Schedule</b>	<b>Mentor Should do</b>
<p><b>Welcome:</b> <b>5 min</b></p>	<p>Short welcome and ask the <b>Mentor</b> to introduce him/herself. Provide a brief welcome to the qualification for the class. Note for Instructor: Throughout this session, please monitor the session to ensure nothing inappropriate is being happened.</p>
<p><b>Icebreaker:</b> <b>10 min</b></p>	<p>Start your session by delivering an icebreaker, this will enable you and your team to start to build rapport and create a team presentation for the tasks ahead. The icebreaker below should work well at introductions and encouraging communication, but feel free to use others if you think they are more appropriate. It is important to encourage young people to get to know each other and build strong team links during the first hour; this will help to increase their motivation and communication throughout the sessions.</p>
<p><b>Introduction &amp; Onboarding:</b> <b>20mins</b></p>	<p>Provide a brief introduction of the qualification to the class and play the “Onboarding Video or Presentation”. In your introduction cover the following:</p> <ol style="list-style-type: none"> <li>1. Explanation of the program and structure. (Kamyab jawan Program)</li> <li>2. How you will use your communication skills in your professional life.</li> <li>3. Key contacts and key information – e.g. role of teacher, mentor, and SEED. Policies and procedures (user agreements and “contact us” section). Everyone to go to the Group Rules tab at the top of their screen, read out the rules, and ask everyone to verbally agree. Ensure that the consequences are clear for using the platform outside of hours. (9am-8pm)</li> <li>4. What is up next for the next 2 weeks ahead so young people know what to expect (see pages 5-7 for an overview of the challenge). Allow young people to ask any questions about the session topic.</li> </ol>
<p><b>Team Activity Planning:</b> <b>30 minutes</b></p>	<p><b>MENTOR:</b> Explain to the whole team that you will now be planning how to collaborate for the first and second collaborative Team Activities that will take place outside of the session. There will not be another session until</p>

	<p>the next session so this step is required because communicating and making decisions outside of a session requires a different strategy that must be agreed upon so that everyone knows what they are doing for this activity and how.</p> <ul style="list-style-type: none"> <li>• “IDENTIFY ENTREPRENEURS” TEAM ACTIVITY</li> <li>• “BRAINSTORMING SOCIAL PROBLEMS” TEAM ACTIVITY”</li> </ul> <p><i>As a team, collaborate on a creative brainstorm on social problems in your community. Vote on the areas you feel most passionate about as a team, then write down what change you would like to see happen.</i></p> <p>Make sure the teams have the opportunity to talk about how they want to work as a team through the activities e.g. when they want to complete the activities, how to communicate, the role of the project manager, etc.</p> <p>Make sure you allocate each young person a specific week that they are the project manager for the weekly activities and make a note of this.</p> <p>Type up notes for their strategy if this is helpful - it can be included underneath the Team Contract.</p>
<p><b>Session Close:</b> <b>5 minutes</b></p>	<p><b>MENTOR:</b> Close the session with the opportunity for anyone to ask any remaining questions.</p> <p><b>Instructor:</b> Facilitate the wrap-up of the session. A quick reminder of what is coming up next and when the next session will be.</p>

## MOTIVATIONAL LECTURES LINKS.

<b>TOPIC</b>	<b>SPEAKER</b>	<b>LINK</b>
How to Face Problems In Life	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=OrQte08MI90">https://www.youtube.com/watch?v=OrQte08MI90</a>
Just Control Your Emotions	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=JzFs_yJt-w">https://www.youtube.com/watch?v=JzFs_yJt-w</a>
How to Communicate Effectively	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=PhHAQEGehKc">https://www.youtube.com/watch?v=PhHAQEGehKc</a>
Your ATTITUDE is Everything	Tony Robbins Les Brown David Goggins Jocko Willink Wayne Dyer Eckart Tolle	<a href="https://www.youtube.com/watch?v=5fS3rj6eIFg">https://www.youtube.com/watch?v=5fS3rj6eIFg</a>
Control Your EMOTIONS	Jim Rohn Les Brown TD Jakes Tony Robbins	<a href="https://www.youtube.com/watch?v=chn86sH0O5U">https://www.youtube.com/watch?v=chn86sH0O5U</a>
Defeat Fear, Build Confidence	Shaykh Atif Ahmed	<a href="https://www.youtube.com/watch?v=s10dzfbozd4">https://www.youtube.com/watch?v=s10dzfbozd4</a>
Wisdom of the Eagle	Learn Kurooji	<a href="https://www.youtube.com/watch?v=bEU7V5rJTtw">https://www.youtube.com/watch?v=bEU7V5rJTtw</a>
The Power of ATTITUDE	Titan Man	<a href="https://www.youtube.com/watch?v=r8LJ5X2ejqU">https://www.youtube.com/watch?v=r8LJ5X2ejqU</a>
STOP WASTING TIME	Arnold Schwarzenegger	<a href="https://www.youtube.com/watch?v=kzSBrJmXqdg">https://www.youtube.com/watch?v=kzSBrJmXqdg</a>
Risk of Success	Denzel Washington	<a href="https://www.youtube.com/watch?v=tbnzAVRZ9Xc">https://www.youtube.com/watch?v=tbnzAVRZ9Xc</a>

**SUCCESS STORY**

S. No	Key Information	Detail/Description
1.	<b>Self &amp; Family background</b>	<p><b>Tabassum</b>, who lives in Lahore, is an example of how hard work and perseverance can reap rich rewards when bidding for projects on soil testing.</p> <p>The soil technician works exclusively on soil and water testing platform and has earned, on average, <b>US\$15,000</b> per month for the past several months. But this isn't a story of overnight success – Tabassum has had to work hard to differentiate himself and stay true to his goal.</p> <p>It was a full year later, in May 2019, when Tabassum finally decided to jump in. He signed up for one of the numerous companies of pesticide and soil testing that connect farmers and landowners with people or companies that have small projects, like testing soil and estimating fertilizer needs.</p> <p>He had already started a small business to help pay for his college education, so he was nervous and apprehensive about the decision. “I gave myself two or three months at most. If I didn't succeed, then I would go back to running the business as it was showing potential,” he says.</p> <p><b>If at first, you don't succeed, try try again</b></p>
2.	<b>How he came on board NAVTTC Training/ or got trained through any other source</b>	Certification in Agriculture soil and water testing technician from STEPS(NAVTTC partner institute)
3.	<b>Post-training activities</b>	<p><b>Tabassum's</b> area of expertise is in <b>soil and water testing technician</b>. In his first month using modern soil and water testing methods, he pitched mostly for projects centered around housing schemes. But it wasn't so simple. In the first few weeks, he didn't hear back from even a single client, despite pitching for dozens of projects.</p> <p>“I needed to understand what worked, so I read blogs, participated in forums, and analyzed profiles of successful freelancers. It was an uphill struggle, but I didn't want to give up,” he explains.</p>

		<p>Tabassum says he understands why clients would be apprehensive giving projects to untested Soil and water testing technician. They have hundreds of options to choose from, he explains, and to give a project to someone with no experience requires a strong leap of faith.</p> <p>A slow stream of projects started to come Tabassum's way. Within a few months, he was landing an average of a hundred projects every month, with a large number of repeat clients. He also expanded the range of his professional services by using his technician competencies in Fertilizer companies,, in farms , in lawn and in horticulture sector.</p> <p>But he's had to face his fair share of challenges too. . “</p>
4.	<b>Message to others (under training)</b>	<p>Take the training opportunity seriously Impose self-discipline and ensure regularity Make Hard work pays in the end so be always ready for the same.</p>

**Note:** Success story is a source of motivation for the trainees and can be presented in several ways/forms in a NAVTTC skill development course as under: -

1. To call a passed out successful trainee of the institute. He will narrate his success story to the trainees in his own words and meet trainees as well.
2. To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful trainee Audio-video recording that has to cover the above-mentioned points.\*
3. The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning, etc) and narrates his/her story in the teacher's own motivational words.

\* *The online success stories of renowned professional can also be obtained from **Annex-II***

## Workplace/Institute Ethics Guide

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Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue, or value to strengthen character and individual abilities. It is a set of values-centered on the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student success:

**1. Attendance:**

Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.

**2. Character:**

Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.

**3. Team Work:**

The ability to get along with others including those you don't necessarily like. The ability to carry your weight and help others who are struggling. Recognize when to speak up with an idea and when to compromise by blend ideas together.

**4. Appearance:**

Dress for success set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are can last a lifetime

**5. Attitude:**

Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems, and procedures in light of changing responsibilities.

**6. Productivity:**

Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know-how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.



**7. Organizational Skills:**

Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Take an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

**8. Communication:**

Written communication, being able to correctly write reports and memos. Verbal communications, being able to communicate one on one or to a group.

**9. Cooperation:**

Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing work situations and the application of new or different skills.

**10. Respect:**

Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept, and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions, and suggestions.