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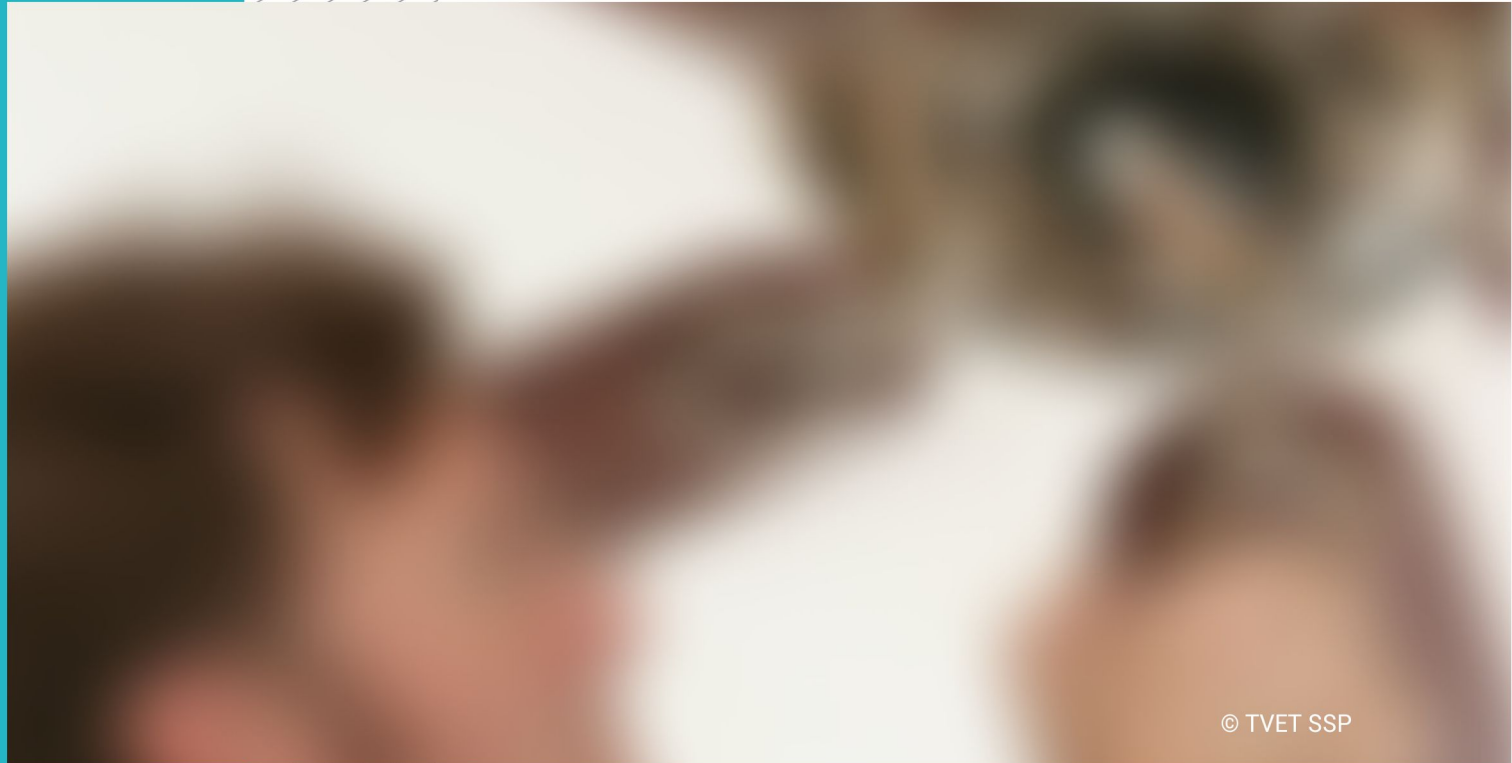
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# FAN MANUFACTURING TECHNICIAN



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## TRAINER GUIDE

National Vocational Certificate Level 3

Version 4 - October, 2019



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## Introduction

Competence-based training helps to bridge the gap between what is taught in training and what tasks will be performed on the job. Training trainees to perform actual job functions helps to ensure that future front-line workers have the skills, knowledge and abilities required to perform their jobs properly, safely and effectively. In addition to competence-based training, assessment based on the performance of actual work competencies helps to ensure that:

- trainees are performing their work tasks as safely as possible
- performance gaps are recognized prior to serious incidents
- training can be implemented to improve competence.

There are significant benefits to competence-based training:

### 1. Cost effectiveness

Since training activities and assessments in a competence-based approach are goal-oriented, trainers focus on clearly defined areas of skills, knowledge and understanding that their own industry has defined in the competence standards. At the same time, trainees are more motivated to learn when they realize the benefits of improved performance.

### 2. Efficiency

The transfer gap between the training environment and working on the job is reduced substantially in a competence-based approach. This is because training and assessment are relevant to what needs to be done on the job. As a result, it takes less time for trainees to become competent in the required areas. This, in turn, contributes to improved efficiency where training and assessment are concerned.

### 3. Increased productivity

When trainees become competent in the competence standards that their own industry has defined, when they know what the performance expectations are and receive recognition for their abilities through successful assessments, they are likely to be more motivated and experience higher job satisfaction. The result is improved productivity for organizations. The communication and constructive feedback between future employers and employees will improve as a result of a competence-based approach, which can also increase productivity.

### 4. Reduced risk

Using a competence-based approach to training, development, and assessment, employers are able to create project teams of people with complementary skills. A trainee's record of the skills, knowledge and understanding relating to the competence standards they have achieved can be used by a future employer to identify and provide further relevant training and assessment for new skills areas. Competence standards can shape employee development and promotional paths within an organization and give employees the opportunity to learn more competencies beyond their roles. It can also provide organizations with greater ability to scale and flex as needed, thereby reducing the risk they face.

## 5. Increased customer satisfaction

Employees who have been trained and assessed using a competence-based approach are, by the definition of the relevant competence standards, able to perform the required tasks associated with a job. The knock-on effect is that, in service-related industries, they are able to provide high service levels, thereby increasing customer satisfaction. In production or manufacturing industries, they are able to work closely to industry standards in a more effective and efficient way.

## Lesson plans

This manual provides a series of lesson plans that will guide delivery of each module for the *Supervisor* qualification. It is important for trainers to be flexible and be ready to adapt lesson plans to suit the context of the subject and the needs of their trainees.

Good teachers acknowledge that CBT means each and every trainee in the class learns at a different speed. The good teacher is prepared to throw aside the day's lesson plan and do something different (and unplanned) for the class even if it means 'writing' a lesson plans for each trainee to match their learning pace for that day or week.

Learning by doing is different from learning theory and then applying it. To learn to do something, trainees need someone looking over their shoulder saying 'it's not quite like that, it's like this', 'you do it like this because ...', or even 'tell me why you chose to do it like this?'

In this way, trainees learn that theoretical knowledge is meaningless if it is not seen in the context of what they are doing. In other words, if a trainee doesn't know why they do something, they will not do it competently (skills underpinned by knowledge = competent performer).

This is how a supervisor acquires a practical grasp of the standards expected. It's not by learning it in theory, but because those standards are acquired through correction by people who show what the standards are, and correct the trainee where they do not meet those standards, and where they repeat it correction until they have internalised those standards.

## Modelling of skill

Modelling (or demonstrating) a skill is a powerful tool, which is used in vocational training. The instructions for trainers for demonstration are as under:

- a) Read the procedure mentioned in the Trainer Guide for the relevant Learning Unit before demonstration.
- b) Arrange all tools, equipment and consumable material, which are required for demonstration of a skill.
- c) Practice the skill before demonstration to trainees, if possible.
- d) Introduce the skill to trainees clearly at the commencement of demonstration.
- e) Explain how the skill relates to the skill(s) already acquired and describe the expected results or show the objects to trainees.
- f) Carry out demonstration in a way that can be seen by all trainees.
- g) Use the same tools and materials that the learner will be using.
- h) Go through EACH of the steps involved in performing the skill.
- i) Go SLOWLY - describe each step as it is completed.
- j) Encourage the learners to move around and watch what you are doing from a number of different angles.

- k) Identify critical or complex steps, or steps that involve safety precautions to be followed.
- l) Explain theoretical knowledge where applicable and ask questions to trainees to test their understanding.
- m) Try to involve the learners: Ask them questions about why they think the process may work that way.
- n) Repeat critical steps in demonstration, if required.
- o) Summarize the demonstration by asking questions to trainees.

Involvement in the process (actively seeing) is important at this stage. When you work on getting involved, getting people to participate, you make them a part of what is happening. Questions for clarification or explanation are important throughout the demonstration. It is up to the learners to ask questions about things they do not understand, but it is also important for trainers to seek out and elicit questions from learners. A trainer may need to do repeated demonstrations of difficult or complex skills.

<b>FORMAT FOR LESSON PLAN</b>			
<b>Module 7: Ensure Quality</b>			
<b>Learning Unit 4: implementing quality standards</b>			
Methods	Key Notes	Media	Time
The tools, equipment and methods used to implement quality standards			
<b>Introduction</b>			
This session will introduce learners to tools, equipment and methods used to implement quality standards by using presentation, demonstration, question and answer, and practical skills development.			
<b>Main Body</b>			
<ul style="list-style-type: none"> <li>• Interpret national and international standards</li> <li>• Adopt national standard</li> <li>• Adopt international standard</li> </ul>			
<b>Conclusion</b>			
To conclude the session, review the the tools, equipment and methods used to implement quality standards. Give learners the opportunity to ask questions.			
<b><u>Assessment</u></b>			
Question and answer, discussion groups with feedback, observation of practice skills development			
<b>Total time: 20 Hours</b>			



## Modules and Learning Units

<b>Course:</b> Fan Manufacturing Technician Level-4 (Supervisor)	<b>Total Course Duration:</b> 430 Hours
<b>Course Overview:</b>	
<p>The purpose of the Fan Manufacturing Technician Level-4 (Supervisor) course is to engage young people with a programme of development that will provide them with the knowledge, skills and understanding to start this career in Pakistan. The course has been developed to address specific issues, such as the work force availability within the country, and meeting and exceeding the needs and expectations of leather products industry.</p>	

Module	Learning Unit	Duration
<b>Module 7:</b> Ensure Quality	<b>LU1:</b> Ensure good atmosphere at workplace <b>LU2:</b> Ensure safe environmental concerns are addressed <b>LU3:</b> Ensure quality of materials <b>LU4:</b> Implement quality standards <b>LU5:</b> Perform electrical and mechanical tests as per relevant standards	110 Hours
<b>Module 8:</b> Supervise production process	<b>LU1:</b> Prepare departmental production plan <b>LU2:</b> Acquire material from store <b>LU3:</b> Assign duties to workers <b>LU4:</b> Ensure production operations according to the plan <b>LU5:</b> Prepare production report	140 Hours

## Teaching & Learning Activities

Module 7: 072200908 Ensure Quality			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p><b>LU1:</b> Ensure good atmosphere at workplace</p>	<p>Deliver an illustrated presentation on keeping good atmosphere at workplace and you address the importance of the following points:</p> <ul style="list-style-type: none"> <li>• Importance of proper lighting at workplace</li> <li>• Importance of proper ventilation at workplace</li> <li>• Importance of good housekeeping practices at workplace</li> </ul> <p>And how to</p> <ul style="list-style-type: none"> <li>• Ensure proper lighting at workplace</li> <li>• Ensure appropriate ventilation</li> <li>• Ensure good housekeeping</li> </ul> <p>Show learners videos/illustrations on good lighting process, proper ventilation at different workplaces. You can explain the video clip to learners in context of why lighting, ventilation and good housekeeping is necessary at workplace</p> <p>Prepare either:</p> <ul style="list-style-type: none"> <li>• A flip chart</li> <li>• A PowerPoint slide</li> <li>• A handout</li> </ul> <p>...showing the key topics about ensuring good atmosphere. Go through all the key topics briefly and then allocate <b>one key topic</b> to each group.</p> <p>Learners need to work in their small groups discussing the key topic that has been allocated to their group. Each group should use a sheet of flip</p>	Classroom	<ul style="list-style-type: none"> <li>• LEDs and hooded lights with reflectors</li> <li>• Exhaust fans</li> <li>• Videos/illustrations on different workplaces in context of lighting, ventilation and good housekeeping is necessary at workplace</li> </ul>

	<p>chart paper to record <b>three main points</b> from their discussions that relate to <b>their key topic</b>.</p> <p>After the discussion, begin the feedback session. Ask one group to come to the front of the class with their flipchart. Put up the flipchart where it can be easily seen by other learners. Ask the group to share the main points they have recorded for their key topic for ensuring good atmosphere. Discuss these main points briefly with the whole group. Learners should make additional notes <b>on the flip chart</b> to record additional points their group had not identified.</p> <p>Then ask the next group to share their flipchart showing the main points they have recorded for the next key topic. Repeat the discussion process. Continue until you have covered all the key topics.</p> <p>End the group discussion activity with a summary. Photograph or scan all the flipcharts and use these to create a handout to distribute to all learners.</p> <p>Visits to different workplaces (Fan related industries) can be beneficial for learners.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to ensure good atmosphere at workplace in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU2:</b> Ensure safe environmental concerns are addressed</p>	<p>Deliver an illustrated presentation on environmental safety at workplace and you address the importance of the following points:</p> <ul style="list-style-type: none"> <li>• Careful handling, storage and usage of harmful materials</li> <li>• Disposing off different waste chemicals and cotton waste</li> </ul>	<p>Classroom Training Workshop</p>	<ul style="list-style-type: none"> <li>• Storage Drums</li> <li>• Waste Box</li> <li>• Different sample data sheets of chemicals</li> <li>• Videos/illustrations on environmental concerns at workplace and careful</li> </ul>

	<ul style="list-style-type: none"> <li>• Interpret and follow the data sheet of hazardous materials</li> <li>• Ensure and follow hazardous instructions</li> </ul> <p>Show learners videos/illustrations on environmental concerns at workplace and careful handling and usage of different hazardous materials.</p> <p>Demonstrate the process of handling different hazardous materials by following their data sheets. Explain different warning signs used in data sheets of different hazardous materials.</p> <p>You can perform an activity in classroom by asking learners about different warning signs.</p> <p>Learners need to devise 10 quiz questions with answers based on ensuring safe environmental concerns are addressed. They must make sure their questions cover key topics for ensuring safe environmental concerns are addressed.</p> <p>Issue each learner with 10 blank cards. Each learner should number the cards and write their name on one side with a question about ensuring safe environmental concerns are addressed. On the reverse of the card, they should write an appropriate answer to their question.</p> <p>For the quiz, arrange learners in two equal teams. Ask one learner to keep score using a suitable score-card. Player 1 for Team A asks one of their questions to Player 1 of Team B, who needs to answer the question. Discuss the answer with the group and ask the group to determine if the answer is correct. Player 1 of Team A then confirms the answer they had devised. (You need to correct answers if the learner's answer was not wholly correct.)</p>		<p>handling and usage of different hazardous materials.</p>
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	<p>The scorekeeper records 1 mark for a correct answer under the appropriate team's score column. Play then passes to Player 1 of Team B, who asks their question to Player 1 of Team A, and so on.</p> <p>Total the scores at the end of the quiz to see which team won.</p> <p>After the quiz, collect learners' question/answer cards and check that answers provided were correct. Return any incorrect answers to learners and ask them to change their answer to the correct one.</p> <p>Learners must be able to demonstrate their knowledge and skills related to ensure environmental safety at workplace. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU3:</b> Ensure quality of materials</p>	<p>Deliver an illustrated presentation on usage of different inspection gauges and measuring instruments to ensure the quality of different materials used in fan industry. Learner should know how to</p> <ul style="list-style-type: none"> <li>• Check gauge of supplied material as per specification</li> <li>• Check weight as per specification</li> <li>• Check dimensions as per specification</li> <li>• Inspect material quality as per specification</li> </ul> <p>Show learners videos/illustrations related to inspection of different materials</p> <p>Demonstrate the process of checking gauge, weight and dimension of different materials with the help of inspection gauges and measuring instruments.</p> <p>An activity can be performed by learners. For</p>	<p>Classroom Training Workshop</p>	<ul style="list-style-type: none"> <li>• Videos/illustrations on related to inspection of different materials</li> <li>• Magnifying glass</li> <li>• Steel Rule</li> <li>• Measuring tape</li> <li>• Digital micrometer</li> <li>• SWG gauge</li> <li>• Go and Not Go gauges</li> <li>• Digital Vernier caliper</li> <li>• Digital weighing scale</li> <li>• Mili Ohm Meter</li> <li>• Jigs and Fixtures</li> </ul>

	<p>example, make groups of learners (each group consist of 2 to 3 learners) and provide them different qualities of same material (i.e. same metal sheet in different gauges) and ask them to inspect them by using required gauges or measuring instruments.</p> <p>This activity is based on a visit to an organization. Learners will experience the process of ensuring quality of materials and gather information on how this is completed.</p> <p>Prepare a short case study giving background information of the organization you have chosen to visit. The information should include:</p> <ul style="list-style-type: none"> <li>• The organization's name</li> <li>• Address of the organization's premises</li> <li>• How long the organization has been in business for?</li> <li>• How many staff are employed?</li> </ul> <p>Discuss the visit with your contact at the organization. The organization needs to prepare a short introduction they can deliver to the learners. The organization will also need suitable staff to explain to the learners about ensuring quality of materials. Ask whether there is any guidance the organization has prepared on ensuring quality of materials that is documented and request a copy of the document.</p> <p>A week before the visit, provide learners with a copy of the case study you have prepared describing the organization. Hold a discussion with the learners on the key points of ensuring quality of materials. Record these as bullet points on a flipchart and ensure learners make a copy.</p>		
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	<p>Ask learners to work in small groups. Each group needs to devise five questions about ensuring quality of materials that they can ask when they visit the organization. Ensure that learners bring their questions with them for the visit.</p> <p>Visit the organization's premises with the learners. The organization needs to deliver a short presentation to the learners about his business. The organization then needs to introduce the staff members that will explain to the learners about ensuring quality of materials. The staff members will then explain to the learners about ensuring quality of materials.</p> <p>After the visit, ask learners to identify the main points identified during the visit that they found interesting or challenging. List these key points on a flip chart.</p> <p>Learners must be able to demonstrate their knowledge and skills related to ensure quality of materials. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU4:</b> Implement quality standards</p>	<p>Deliver an illustrated presentation which consist of following topics</p> <ul style="list-style-type: none"> <li>• What is standardization and why it is important in context of quality assurance and quality control (QA &amp; QC)</li> <li>• Different international and national standard related to fan industry</li> </ul> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Interpret national and international standards</li> <li>• Adopt national standard</li> </ul>	<p>Classroom Training Workshop</p>	<ul style="list-style-type: none"> <li>• Relevant sample standard documents</li> </ul>

	<ul style="list-style-type: none"> <li>• Adopt international standard</li> </ul> <p>Show learners different sample quality standard documents. Explain them different units of quality standard document and their interpretation according to the workplace.</p> <p>An activity can be performed by learners. For example, provide different sample quality standard document to each learner and ask him to present his interpretation of that quality standard document in front of class and also explain that how that standard will be implemented at workplace.</p> <p>Another activity is based on a visit to an organization. Learners will experience the process of implementing quality standards and gather information on how this is completed.</p> <p>Prepare a short case study giving background information of the organization you have chosen to visit. The information should include:</p> <ul style="list-style-type: none"> <li>• The organization's name</li> <li>• Address of the organization's premises</li> <li>• How long the organization has been in business for?</li> <li>• How many staff are employed?</li> </ul> <p>Discuss the visit with your contact at the organization. The organization needs to prepare a short introduction they can deliver to the learners. The organization will also need suitable staff to explain to the learners about implementing quality standards. Ask whether there is any guidance the organization has prepared on implementing quality standards that is documented and request a copy of the document.</p>		
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	<p>A week before the visit, provide learners with a copy of the case study you have prepared describing the organization. Hold a discussion with the learners on the key points of implementing quality standards. Record these as bullet points on a flipchart and ensure learners make a copy.</p> <p>Ask learners to work in small groups. Each group needs to devise five questions about implementing quality standards that they can ask when they visit the organization. Ensure that learners bring their questions with them for the visit.</p> <p>Visit the organization's premises with the learners. The organization needs to deliver a short presentation to the learners about his business. The organization then needs to introduce the staff members that will explain to the learners about implementing quality standards. The staff members will then explain to the learners about implementing quality standards.</p> <p>After the visit, ask learners to identify the main points identified during the visit that they found interesting or challenging. List these key points on a flip chart.</p> <p>Learners must be able to demonstrate their knowledge and skills related to different quality standards. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU5:</b> Perform electrical and mechanical tests as per relevant standards</p>	<p>Deliver an illustrated presentation about different electrical and mechanical tests parameters as per relevant standards.</p> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Interpret electrical/mechanical tests as per</li> </ul>	<p>Classroom Training Workshop</p>	<ul style="list-style-type: none"> <li>• Videos/illustration different electrical and mechanical tests as per relevant standards</li> <li>• Anemometer</li> </ul>

	<p>relevant standards</p> <ul style="list-style-type: none"> <li>• Adopt electrical/mechanical tests as per relevant standards</li> </ul> <p>Invite an industrial expert to share his practical knowledge with learners about his experience in fan manufacturing sector regarding electrical and mechanical tests on fans.</p> <p>Show learners videos/illustrations of different electrical and mechanical tests as per relevant standards</p> <p>Perform all electrical and mechanical tests as per relevant standards of fan industry in front of learners and explain the significance of each test according to their relevant standard.</p> <p>An activity can be performed by learners. For example, divide them into groups (each group may be of 3 to 5 learners) and ask them to perform different electrical and mechanical tests on provided different fan parts.</p> <p>Prepare either:</p> <ul style="list-style-type: none"> <li>• A flip chart</li> <li>• A PowerPoint slide</li> <li>• A handout</li> </ul> <p>...showing key topics for performing electrical and mechanical tests as per relevant standards.</p> <p>Learners need to work in small groups discussing the key topics. Each group should make notes from their discussions that identify <b>three main points</b> that related to <b>each key topic</b>.</p> <p>After the discussion, begin the feedback session. Ask one group to share the main points they have recorded for the first key topic for performing</p>		<ul style="list-style-type: none"> <li>• Watt meter</li> <li>• Volt meter</li> <li>• Ampere meter</li> <li>• Power factor meter</li> <li>• Frequency meter</li> <li>• Tachometer</li> <li>• Sound level meter</li> <li>• Temperature meter</li> <li>• Insulation tester</li> <li>• Die electric tester</li> <li>• Multi meter</li> <li>• Brinell, Rockwell and Vickers hardness testers</li> <li>• Viscosity meter</li> <li>• Gloss meter</li> <li>• Film thickness meter</li> <li>• Different fan parts and complete fan for testing</li> </ul>
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	<p>electrical and mechanical tests as per relevant standards. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified.</p> <p>Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics.</p> <p>End the group discussion activity with a summary.</p> <p>Learners must be able to demonstrate their knowledge and skills related perform electrical and mechanical tests as per relevant standards .Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
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**Module 8: 072200909 Supervise production process**

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p><b>LU1:</b> Prepare departmental production plan</p>	<p>Deliver a presentation which includes some videos and illustration on departmental production planning and preparing, handle the production department. This presentation will cover the following points including demonstrations of equipment, production process and plan the production process</p> <ul style="list-style-type: none"> <li>• Different production processes involved in the fan manufacturing industry</li> <li>• Production types i.e. mass production, unit production, continuous and batch production</li> <li>• Types of tools and equipment</li> <li>• Checking the condition of different sorts of tools and equipment</li> <li>• The implications are of not maintaining tools and equipment</li> <li>• The implications are of not keeping tools and equipment clean</li> <li>• Storing tools and equipment properly</li> <li>• Recognizing tools and equipment that are damaged or need maintenance</li> <li>• Working on production plan</li> <li>• Set the priority</li> <li>• Production scheduling and material requirement planning</li> <li>• Importance of labor and time management</li> <li>• Selection of raw material grades according to the needs and their quality parameters</li> </ul>	<p>Classroom OR Training in company workshop.</p>	<ul style="list-style-type: none"> <li>• Videos /illustration related to production planning</li> <li>• Illustrations from catalogues or the internet of equipment used to prepare, finish complex prepare departmental production plan</li> </ul>

	<ul style="list-style-type: none"> <li>• Quality Control and Quality Assurance</li> </ul> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Identify the machinery required for relevant process</li> <li>• Ensure the availability of required tools and equipment for relevant process</li> <li>• Incorporate machine maintenance schedule in the production plan</li> <li>• Prepare machine wise production schedule to ensure in time delivery</li> <li>• Ensure the usage of PPE according to process requirement</li> </ul> <p>Invite a shop floor manager or supervisor from fan manufacturing sector to share his knowledge with learners.</p> <p>Involve learners during this presentation by asking them about their previous working experience in their respective departments. Arrange a question and answer session to clarify trainee understanding.</p> <p>A quiz/test can be taken during the class to judge the understanding of each learner about basic components of any departmental production plan.</p> <p>Divide learner into different groups to perform a group activity (each group can be of 3 to 5 students). Every group will be provided by any scenario of mock fan industry and group members have to prepare departmental production plan of different assigned fan parts.</p> <p>Learners must be able to demonstrate their knowledge and skills related to preparing</p>		
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	departmental production plan. Ensure that learners have the opportunity to ask questions to support their understanding.		
<b>LU2:</b> Acquire material from store	<p>You can come in the class with few fan parts in hand and start asking learners about different materials used in their manufacturing. Deliver an illustrated presentation (including videos and illustrations if possible) on the following points:</p> <ul style="list-style-type: none"> <li>• Knowledge about usage of different raw materials required in fan manufacturing</li> <li>• Process of acquiring and handling required material for production process</li> </ul> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Generate the demand order to raw material store as per production schedule</li> <li>• Ensure availability of raw material as per required generated order (Metallurgical and Physical)</li> <li>• Distribute raw material to production processes in required quantities</li> </ul> <p>Demonstrate the importance of distribution of raw materials to different ongoing production processes in required quantities for smooth running of operations</p> <p>An activity can be performed in the class. For example, each learner can be asked to tell all the material required to manufacture assigned fan part</p> <p>OR</p> <p>Learners can be divided into groups and different fan parts will be assigned to each group. Each group will have to write down all the required</p>	Classroom OR Training in company workshop.	<ul style="list-style-type: none"> <li>• Videos /illustration related to production planning</li> <li>• Relevant information material</li> </ul>

	<p>materials for manufacturing assigned fan part and they have to prepare material requisition request for getting required material from store.</p> <p>Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU3:</b> Assign duties to workers</p>	<p>Prepare either a flip chart, PowerPoint slides or handouts on</p> <ul style="list-style-type: none"> <li>• Understanding the duties of working</li> <li>• Prepare the production documents</li> <li>• Working on how to assign the duties Ensuring appropriate management of contractors</li> <li>• Task management, time management and workforce management.</li> </ul> <p>Learners must know how to</p> <ul style="list-style-type: none"> <li>• Assign jobs to the workers along with work instructions</li> <li>• Train workers on their assigned tasks and work instructions</li> <li>• Monitor the workers' performance as per instructions</li> </ul> <p>Invite a shop floor manager or supervisor from fan manufacturing sector to share his knowledge with learners.</p> <p>Show learners different videos on team building importance.</p> <p>Learners need to work in small groups discussing the key topics. Each group should make notes from their discussions that identify three main points that related to each key topic.</p> <p>After the discussion, begin the feedback session. Ask one group to share the main points they have</p>	Class room	<ul style="list-style-type: none"> <li>• Videos /illustration related to team building importance</li> <li>• Relevant information material</li> </ul>

	<p>recorded for the first key topic for the importance of task management, time management and workforce management. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified.</p> <p>Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics.</p> <p>End the group discussion activity with a summary.</p> <p>Ask each individual about their previous experience of working in their respective departments. They will tell you about their job responsibilities and higher management expectations from them. Each individual should be given a chance to express his experience of working as worker in the team during their previous jobs. Now as a trainer, keeping in view the learners past experiences, you can emphasize the importance of task management and how well they can effectively supervise the ongoing activities in the workshop by assigning right rule to the right people and how to train the workers for specific job assigned.</p> <p>Visits to different workplaces (Fan related industries) can be beneficial for learners</p> <p>Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p><b>LU4:</b> Ensure production operations according to the plan</p>	<p>Invite an experienced colleague who has wide working experience in fan manufacturing industry as a supervisor and he will deliver an illustrated presentation on importance of production lead</p>	<p>Class room Real or realistic fan manufacturing environment</p>	<p>videos and illustrations related to inspection of production operations Relevant information material</p>



	<p>time and on-site inspection.</p> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Ensure quality of product as per requirement</li> <li>• Ensure quantity of instrument produced as per production plan</li> <li>• Make sure the completion of production process within the lead time</li> <li>• Confirm data entry at every stage in process travel cards or process production reports</li> </ul> <p>Trainees need to practice their skills in independently in realistic fan manufacturing environment about</p> <ul style="list-style-type: none"> <li>• Maintain the production line</li> <li>• Understand the production process</li> </ul> <p>Prepare a PowerPoint presentation about production operations of fan related parts. Learners need to work in small groups discussing the key topics. Each group should make notes from their discussions that identify three main points that related to each key topic.</p> <p>After the discussion, begin the feedback session. Ask one group to share the main points they have recorded for the first key topic for the importance of planning fan manufacturing processes. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified.</p> <p>Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics.</p>		
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	<p>End the group discussion activity with a summary</p> <p>Each learner has some background work experience. Invite every learner to tell about what previous practices are being followed at their workplace. You can point out the area of improvements in their workplace if any and encourage all the trainers to participate actively in this knowledge sharing activity.</p> <p>Show learners videos and illustrations related to inspection of production operations.</p> <p>Industrial visits to fan manufacturing industries will surely enhance the understanding of learners about how to ensure production operations according to the plan by actually seeing all these practices carried in the industries.</p> <p>This activity is based on a visit to an organization. Learners will experience the process of ensuring production operations according to the plan and gather information on how this is completed.</p> <p>Prepare a short case study giving background information of the organization you have chosen to visit. The information should include:</p> <ul style="list-style-type: none"> <li>• The organization's name</li> <li>• Address of the organization's premises</li> <li>• How long the organization has been in business for?</li> <li>• How many staff are employed?</li> </ul> <p>Discuss the visit with your contact at the organization. The organization needs to prepare a short introduction they can deliver to the learners. The organization will also need suitable staff to explain to the learners about ensuring production</p>		
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	<p>operations according to the plan. Ask whether there is any guidance the organization has prepared on ensuring production operations according to the plan that is documented and request a copy of the document.</p> <p>A week before the visit, provide learners with a copy of the case study you have prepared describing the organization. Hold a discussion with the learners on the key points of ensuring production operations according to the plan. Record these as bullet points on a flipchart and ensure learners make a copy.</p> <p>Ask learners to work in small groups. Each group needs to devise five questions about ensuring production operations according to the plan that they can ask when they visit the organization. Ensure that learners bring their questions with them for the visit.</p> <p>Visit the organization's premises with the learners. The organization needs to deliver a short presentation to the learners about his business. The organization then needs to introduce the staff members that will explain to the learners about ensuring production operations according to the plan. The staff members will then explain to the learners about ensuring production operations according to the plan.</p> <p>After the visit, ask learners to identify the main points identified during the visit that they found interesting or challenging. List these key points on a flip chart.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to execute production processes according to the plan.</p>		
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	<p>Ensure that learners have the opportunity to ask questions to support their understanding.</p> <p>After the practical sessions are complete, lead a feedback session. Ask learners to complete a self-assessment form on their ability to ensure production operations according to the plan. Ask questions to confirm their understanding. Provide opportunities for trainees to ask their own questions.</p>		
<p><b>LU5:</b> Prepare production report</p>	<p>Deliver an illustrated presentation on following points:</p> <ul style="list-style-type: none"> <li>• Importance of report writing in any industry to share work done with higher management</li> <li>• Data analysis with quality tools (control charts, bar graphs, normal charts etc.)</li> <li>• Usage of Microsoft Office (Word, Excel, Power Point)</li> </ul> <p>Learner must know how to</p> <ul style="list-style-type: none"> <li>• Gather and consolidate the production data in concise form for further analysis</li> <li>• Analyse data using relevant quality tools (control charts, bar graphs, normal charts etc.)</li> <li>• Compile production report and submit and present the report to management within defined timeline</li> </ul> <p>Show learners different sample production reports and ask them to read it carefully</p> <p>Divide learners into different groups (each group may of 2 to 3 students) and assign them different mock production processes. Each group have to gather and consolidate production data and</p>	<p>Classroom</p>	<ul style="list-style-type: none"> <li>• Videos /illustration related to production reports</li> <li>• Sample production reports</li> <li>• Relevant information material</li> </ul>

	<p>further analysis using different quality tools will be done on that data and all those results will be finally compile into production report by each group.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to prepare production report.Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
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## Frequently Asked Questions

<p>1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?</p>	<p>Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.</p>
<p>2. What is the passing criterion for CBT certificate?</p>	<p>You shall be required to be declared “Competent” in the summative assessment to attain the certificate.</p>
<p>3. What are the entry requirements for this course?</p>	<p>The entry requirement for this course is National Vocational Certificate Level-3 in Fan Manufacturing Technician (Winder) or National Vocational Certificate Level-3 in Fan Manufacturing Technician (Assembler).</p>
<p>4. How can I progress in my educational career after attaining this certificate?</p>	<p>You shall be able to progress further to a level-5, DAE or equivalent course in relevant trade. In certain case, you may be required to attain an equivalence certificate from The Inter Board Committee of Chairmen (IBCC).</p>
<p>5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?</p>	<p>You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.</p>
<p>6. What is the entry requirement for Recognition of Prior Learning program (RPL)?</p>	<p>There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.</p>
<p>7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?</p>	<p>There are no age restrictions to enter this course or take up the Recognition of Prior Learning program.</p>
<p>8. What is the duration of this course?</p>	<p>The duration of the course work is 430 Hours</p>
<p>9. What are the class timings?</p>	<p>The classes are normally offered 25 days a month from 08:00am to 01:30pm. These may vary according to the practices of certain institutes.</p>

10. What is equivalence of this certificate with other qualifications?	As per the national vocational qualifications framework, the level-4 certificate is equivalent to Matriculation. The criteria for equivalence and equivalence certificate can be obtained from The Inter Board Committee of Chairmen (IBCC).
11. What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTTC website.
12. Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	You shall be able to take up jobs in the fan manufacturing industries as supervisor
13. What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.
14. Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15. Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16. How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount.
17. Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18. What is the teaching language of this course?	The teaching languages of this course are Urdu and English.
19. Is it possible to switch to other certificate programs during the course?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
20. What is the examination / assessment	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student.

system in this program?	Final / summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared "Competent" in the summative assessment to attain the certificate.
21. Does this certificate enable me to work as freelancer?	You can start your small business of computerized pattern designing. You may need additional skills on entrepreneurship to support your initiative.



## Test Yourself (Short & Multiple Choice Questions)

### For Module 7:

1	Which instrument is used to measure sheet metal thickness a) Measuring tape b) SWG c) Vernier Calipers d) Micrometer	<b>Answer:</b> b) SWG
2	Tachometer is used for measuring a) Electric current b) Electric resistance c) Rotational speed d) Frequency	<b>Answer:</b> c) Rotational speed
3	Dielectric tester is used for a) Measuring current b) Measuring power c) Measuring insulation d) Measuring inductance	<b>Answer:</b> c) Measuring insulation
4	Mili ohm meter is used to check a) Low resistance of connecting wires b) Short circuit c) Power loss d) conductivity	<b>Answer:</b> a). Low resistance of connecting wires
5	Load of electric fan motor is measured in a) Ampere b) Kilo Watt hour c) Ohm d) Hertz	<b>Answer:</b> a) Ampere

6	What is forced ventilation?	<b>Answer:</b> A type of building ventilation system that uses fans or blowers to provide fresh air to rooms when the forces of air pressure and gravity are not enough to circulate air through a building.
7	Describe hazardous materials?	<b>Answer:</b> Hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.
8	What is ISO?	<b>Answer:</b> The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from various national standards organizations. Founded on 23 February 1947, the organization promotes worldwide proprietary, industrial and commercial standards.
9	What is mean by sheet metal gauge?	<b>Answer:</b> The thickness of sheet metal is commonly specified by a traditional, non-linear measure known as its gauge. The larger the gauge number, the thinner the metal. Commonly used steel sheet metal ranges from 30 gauge to about 7 gauge.
10	Why good housekeeping is important of workplace?	<b>Answer:</b> Effective housekeeping can help control or eliminate workplace hazards. Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste materials and other fire hazards from work areas.
11	Chemicals are store in well ventilated place a) True b) False	<b>Answer:</b> a) True

12	<p>Our national standard system is called ISO Standard</p> <p>a) True b) False</p>	<p><b>Answer:</b></p> <p>b). False</p>
13	<p>What is quality Control?</p>	<p><b>Answer:</b></p> <p>Quality Control is a set of activities for ensuring quality in products. The activities focus on identifying defects in the actual products produced.</p>
14	<p>What is quality Assurance?</p>	<p><b>Answer:</b></p> <p>Quality Assurance aims to prevent defects with a focus on the process used to make the product. Quality control, therefore, is a reactive process.</p>

**For Module 8:**

1	What is batch production?	<p><b>Answer:</b> Batch production occurs when many similar items are produced together. Each batch goes through one stage of the production process before moving onto next stage.</p>
2	What is process travel chart?	<p><b>Answer:</b> Process travel chart shows the sequence of processes required at shop floor. A process travel chart is a model that shows how parts are fitted together, the order in which they are assembled, and an overall view of the product. This chart is great for seeing an overall view of the process.</p>
3	Why analysis of data is important?	<p><b>Answer:</b> Using real-time production data, anyone can get following benefits:</p> <ul style="list-style-type: none"> <li>• Improve quality by identifying potential errors early, before they become more serious (and costly) problems</li> <li>• Better respond to change on the shop floor by improving efficiency with data-driven process adjustments</li> </ul>
4	What is lead time in manufacturing?	<p><b>Answer:</b> The manufacturing lead time is the time period between the placement of an order and the shipment of the completed order to the customer. A short manufacturing lead time is a competitive advantage; many customers want the delivery of their products as soon as possible following the placement of the order.</p>
5	What are different types of maintenance philosophies?	<p><b>Answer:</b> General types of maintenance philosophies are</p> <ul style="list-style-type: none"> <li>• Corrective maintenance</li> <li>• Preventive maintenance</li> <li>• Predictive maintenance</li> </ul>
6	To ensure the availability of tools and equipment is the responsibility of the supervisor	<p><b>Answer:</b> a) True</p>

	<ul style="list-style-type: none"> <li>a) True</li> <li>b) False</li> </ul>	
7	A supervisor knows about material ..... and their quality	<b>Answer:</b> Grades
8	Production report is necessary for ..... <ul style="list-style-type: none"> <li>a) Better quality control</li> <li>b) Good housekeeping</li> <li>c) For fire emergency plan</li> <li>d) For Health and safety awareness</li> </ul>	<b>Answer:</b> a) Better quality control
9	Preparing machine wise production schedule is needed for <ul style="list-style-type: none"> <li>a) In time delivery</li> <li>b) For data entry</li> <li>c) For good work atmosphere</li> <li>d) For workforce satisfaction</li> </ul>	<b>Answer:</b> a) In time delivery
10	Requisition form is used <ul style="list-style-type: none"> <li>a) To dispose of material</li> <li>b) To demand a material</li> <li>c) To deliver a material</li> <li>d) To inspect a material</li> </ul>	<b>Answer:</b> b). To demand a material
11	Mass production means <ul style="list-style-type: none"> <li>a) Producing small number of units of any product</li> <li>b) Producing medium number of units of any product</li> <li>c) Producing customized product</li> <li>d) Producing large quantities of a standardized product</li> </ul>	<b>Answer:</b> d). Producing large quantities of a standardized product
12	Microsoft ..... is used for compiling reports <ul style="list-style-type: none"> <li>a) Word</li> <li>b) Excel</li> <li>c) PowerPoint</li> <li>d) Access</li> </ul>	<b>Answer:</b> a). Word

