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ANDROID APPLICATION DEVELOPER



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TRAINER GUIDE

National Vocational Certificate Level 4

Version 1 - 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 *Android Application Developer* 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 plan 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 an *Android Application Developer* 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 internalized those standards.

Demonstration of skill

Demonstration or modeling 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.

Overview of the program

Course: Android Application Developer	Total Course Duration: 3220 hours
Course Overview:	
<i>The competency based NVQ has been developed to train the unskilled men and women of Pakistan on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increase in their livelihood income generation.</i>	
<i>The purpose of these qualifications is to set professional standards for Android Application Developer experts, who will serve as key elements enhancing quality of Pakistan's Software Developing Industry.</i>	

Module Title and Aim	Learning Units	Duration
<p>Module 20: Contribute to Work Related Health and Safety (WHS) Initiatives</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Contribute to Work Related Health and Safety (WHS) Initiatives</p>	<p>LU1: Contribute to initiate work-related health and safety measures LU2: Contribute to establish work-related health and safety measures LU3: Contribute to ensure legal requirements of WHS measures LU4: Contribute to review WHS measures LU5: Evaluate the organization’s WHS system</p>	30 hours
<p>Module 21: Analyze Workplace Policy and Procedures</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Analyze Workplace Policy and Procedures</p>	<p>LU1: Manage work timeframes LU2: Manage to convene meeting LU3: Decision making at workplace LU4: Set and meet own work priorities at instant LU5: Develop and maintain professional competence LU6: Follow and implement work safety requirements</p>	30 hours
<p>Module 22: Perform Advanced Communication</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Perform Advanced Communication</p>	<p>LU1: Demonstrate professional skills LU2: Plan and Organize work LU3: Provide trainings at workplace</p>	30 hours
<p>Module 23: Develop Advance Computer</p>	<p>LU1: Manage Information System to complete a task LU2: Prepare Presentation using computers</p>	40 hours

Module Title and Aim	Learning Units	Duration
<p>Application Skills</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Develop Advance Computer Application Skills</p>	<p>LU3: Use Microsoft Access to manage database</p> <p>LU4: Develop graphics for Design</p>	
<p>Module 24: Manage Human Resource Services</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Manage Human Resource Services</p>	<p>LU1: Determine strategies for delivery of human resource services</p> <p>LU2: Manage the delivery of human resource services</p> <p>LU3: Evaluate human resource service delivery</p> <p>LU4: Manage integration of business ethics in human resource practices</p>	20 hours
<p>Module 25: Develop Entrepreneurial Skills</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Develop Entrepreneurial Skills</p>	<p>LU1: Develop a business plan</p> <p>LU2: Collect information regarding funding sources</p> <p>LU3: Develop a marketing plan</p> <p>LU4: Develop basic business communication skills</p>	30 hours
<p>Module 26: Undertake Research & Planning for Apps Development</p> <p>Aim: This module aims to develop the</p>	<p>LU1: Identify Market Trends Using Apps</p> <p>LU2: Identify Required Skill set to Develop App</p> <p>LU3: Plan to Develop Apps (Work Flow)</p>	90 hours

Module Title and Aim	Learning Units	Duration
<p>knowledge, skills and understanding needed to Undertake Research & Planning for Apps Development</p>		
<p>Module 27: Develop and Analyse Algorithm for Coding</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Develop and Analyse Algorithm for Coding</p>	<p>LU1: Analyze Problem Statement for Possible Solutions LU2: Perform best Solutions</p>	150 hours
<p>Module 28: Develop Software Development Life Cycle (SDLC) for Apps Development</p> <p>Aim: This module aims to develop the knowledge, skills and understanding needed to Develop Software Development Life Cycle (SDLC) for Apps Development</p>	<p>LU1: Plan a Project LU2: Perform Requirement Analysis LU3: Design a Project LU4: Implement a Project LU5: Test a Project LU6: Execute a Project</p>	470 hours
<p>Module 29: Apply Design Pattern for Android App</p> <p>Aim: This module aims to develop the</p>	<p>LU1: Identify the Basic of Design Pattern for Android App LU2: Implement Design Pattern for android app LU3: Test Design pattern for android App</p>	250 hours

Module Title and Aim	Learning Units	Duration
<p>knowledge, skills and understanding needed to Apply Design Pattern for Android App</p>		
<p>Module 30: Develop Professional Android App Aim: This module aims to develop the knowledge, skills and understanding needed to Develop Professional Android App</p>	<p>LU1: Apply Version Control System LU2: Develop Android App using Web API's LU3: Develop Advance Interface Design</p>	170 hours
<p>Module 31: Assure the Quality of Mobile App Aim: This module aims to develop the knowledge, skills and understanding needed to Assure the Quality of Mobile App</p>	<p>LU1: Prepare test cases LU2: Execute Test Cases LU3: Comply with Privacy Policy of App</p>	190 hours
<p>Module 32: Develop Professionalism Capable of Android Development Aim: This module aims to develop the knowledge, skills and understanding needed to Develop Professionalism Capable of Android Development</p>	<p>LU1: Develop Employability Skills LU2: Develop Freelance Business LU3: Expand Professional Network</p>	100 hours

FORMAT FOR LESSON PLAN			
Module 29: Apply Design Pattern for Android App			
LU1:			
Identify the Basic of Design Pattern for Android App			
Methods	Key Notes	Media	Time
The tools, material and techniques used for using apply design pattern for android app			
Introduction			
This session will introduce learners to the tools, techniques and material used for preparing workstation for winch dyeing, using presentation, demonstration, question and answer, and practical skills development.			
Main Body			
<ul style="list-style-type: none"> • Identify design pattern for android APP • Identify relevant design pattern as per requirement 			
Conclusion			
To conclude the session, review the tools, techniques and material used for using apply design pattern for android app. Give learners the opportunity to ask questions.			
Assessment			
Question and answer, discussion groups with feedback, observation of practice skills development			

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Module-20
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Trainer's guidelines

Module 20: Contribute to Work Related Health and Safety (WHS) Initiatives			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module 21: Analyze Workplace Policy and Procedures			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module 22: Perform Advanced Communication			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module-23
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Module 23: Develop Advance Computer Application Skills			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module-24
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Module 24: Manage Human Resource Services			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module-25
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Module 25: Develop Entrepreneurial Skills			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1:			
LU2:			
LU3:			
LU4:			

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Module-26
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Module 26: 0613001026 Undertake Research & Planning for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<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>Demonstrate the materials needed for how to identify market trends using apps. Enable learners to practice using the appropriate materials for how to identify market trends using apps in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to identify market trends using apps in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
LU2: Identify Required Skill set to Develop App	Lead a discussion on how to identify required skill set to develop app. Encourage ALL trainees to participate in the discussion. Ensure that the discussion addresses the following points:	Practical Classrooms	labs, Learner Guide Handouts Videos

Module 26: 0613001026 Undertake Research & Planning for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to identify required skill set to develop app. Go through all the key topics briefly and then allocate one key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</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 how to identify required skill set to develop app. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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.</p>		Multi-media projector

Module 26: 0613001026 Undertake Research & Planning for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>Photograph or scan all the flipcharts and use these to create a handout to distribute to all learners.</p> <p>Demonstrate the materials needed for how to identify required skill set to develop app. Enable learners to practice using the appropriate materials for how to identify required skill set to develop app in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to identify required skill set to develop app in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
LU3: Plan to Develop Apps (Work Flow)	<p>Lead a brainstorm on how to plan to develop apps (work flow) . List the brainstorm ideas on a flipchart. If necessary, prompt learners to consider the following:</p> <ol style="list-style-type: none"> 1. Develop timeline for app development. 2. Develop app work flow based on gathered information. 3. Develop a project proposal <p>Prepare either:</p> <ul style="list-style-type: none"> • A flip chart 	<p>Practical Classrooms</p> <p>labs,</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 26: 0613001026 Undertake Research & Planning for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<ul style="list-style-type: none"> • A PowerPoint slide • A handout <p>...showing key topics for how to plan to develop apps (work flow) . 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 how to plan to develop apps (work flow) . 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>Demonstrate the materials needed for how to plan to develop apps (work flow) . Enable learners to practice using the appropriate materials for how to plan to develop apps (work flow) in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to plan to develop apps (work flow) in an appropriate practical setting. Ensure that learners have the opportunity to ask questions</p>		

Module 26: 0613001026 Undertake Research & Planning for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	to support their understanding.		

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Module 27: 0613001027 Develop and Analyse Algorithm for Coding

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Analyze Problem Statement for Possible Solutions	<p>Deliver an illustrated presentation on how to Analyze Problem Statement for Possible Solutions. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Gather information of issues for problem statement as per functional and non-functional requirements <ul style="list-style-type: none"> - Make a list of issues - Analyze the issues for problem statement - Review of problem statement constraints 2. Identify different possible solutions for problem <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to Analyze Problem Statement for Possible Solutions. Go through all the key topics briefly and then allocate one key topic 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</p>	Practical Classrooms labs,	Learner Guide Handouts Videos Multi-media projector

Module 27: 0613001027 Develop and Analyse Algorithm for Coding

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>group should use a sheet of flip chart paper to record three main points from their discussions that relate to their key topic.</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 how to Analyze Problem Statement for Possible Solutions. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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>Demonstrate the materials needed for how to Analyze Problem Statement for Possible Solutions. Enable learners to practice using the appropriate materials for how to Analyze Problem Statement for Possible Solutions in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Analyze Problem Statement for Possible Solutions in an appropriate practical</p>		

Module 27: 0613001027 Develop and Analyse Algorithm for Coding			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	setting. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU2: Perform best Solutions	<p>Invite an experienced colleague to deliver a presentation about how to perform best solutions. Ensure that the presentation addresses the following points:</p> <ol style="list-style-type: none"> 1. Make graphical representation of selected solution. 2. Select best solution for problem as per given instruction 3. Arrange the sequence of tasks 4. Identify the statement of a pseudo code which establishes the main goal 5. Write the pseudo code accordingly <p>Prepare a short case study giving background information of the mobile app developer expert. The information should include:</p> <ul style="list-style-type: none"> • The mobile app developer expert's name • Address of the mobile app developer expert's organization • How long the mobile app developer expert has been practising for 	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 27: 0613001027 Develop and Analyse Algorithm for Coding

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<ul style="list-style-type: none">• How many staff are employed by the organization. <p>Discuss the topic of how to perform best solutions with the invited mobile app developer expert. The mobile app developer expert needs to prepare a short introduction about their organization they can deliver to the learners at the beginning of their presentation. Ask the mobile app developer expert to bring with him/her materials that will support the presentation, for example relevant resources, photographs, records.</p> <p>A week before the presentation, provide learners with a copy of the case study you have prepared describing the mobile app developer expert's organization. Hold a discussion with the learners on the key points of how to perform best solutions. 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 how to perform best solutions that they can ask during the presentation. Ensure that learners bring their questions with them for the presentation.</p> <p>On the day of the presentation, introduce the mobile app developer expert to the learners. The mobile app developer expert needs to deliver the presentation to the learners about their organization and how their organization manages how to perform best solutions. Following the presentation, ask selected learners to ask the questions they had devised. Encourage discussion about</p>		

Module 27: 0613001027 Develop and Analyse Algorithm for Coding			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>the key points of how to perform best solutions.</p> <p>Following the presentation, learners need to write up the answers to the questions their group had devised and submit these to you as part of their evidence.</p> <p>Demonstrate the materials needed for how to perform best solutions. Enable learners to practice using the appropriate materials for how to perform best solutions in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to perform best solutions in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

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Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p>LU 1: Plan a project</p>	<p>Deliver an illustrated presentation on how to plan a project. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Use task management tools to develop a timeline for a given project 2. Distribute tasks across software team as per the project specifications 3. Track tasks of the team as per assigned module 4. Generate report to evaluate performance of the team as per assigned task. <p>Display a slide or flip chart with a key question relating to how to plan a project.</p> <p>Step 1 – Think Working on their own, each learner thinks about the question and makes notes of their responses or key points which they believe to be important.</p> <p>Step 2 – Pair For the next step, each learner pairs up with a partner. The two learners exchange their ideas and make further notes to add clarity to their own ideas.</p> <p>Step 3 – Share</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>The final step is for you to invite different pairs to share the ideas they have discussed in response to the key question relating to how to plan a project.</p> <p>Demonstrate the materials needed for how to plan a project. Enable learners to practice using the appropriate materials for how to plan a project in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to plan a project in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
LU2: Perform Requirement Analysis	<p>Lead a discussion on how to perform requirement analysis. Encourage ALL trainees to participate in the discussion. Ensure that the discussion addresses the following points:</p> <ol style="list-style-type: none"> 1. Gather requirements by communicating with the customer for given project 2. Analyze requirements to determine the quality of the given project 	Practical Classrooms labs,	Learner Guide Handouts Videos Multi-media projector

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>3. Develop Software Requirement Specification (SRS) document for the given project</p> <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to perform requirement analysis. Go through all the key topics briefly and then allocate one key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</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 how to perform requirement analysis. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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.</p>		

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>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>Demonstrate the materials needed for how to perform requirement analysis. Enable learners to practice using the appropriate materials for how to perform requirement analysis in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to perform requirement analysis in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
LU3: Design a project	<p>Invite an experienced colleague to deliver a presentation about how to design a project. Ensure that the presentation addresses the following points:</p> <p>Prepare a short case study giving background information of the mobile app developer expert. The information should include:</p> <ul style="list-style-type: none"> • The mobile app developer expert’s name • Address of the mobile app developer expert’s organization • How long the mobile app developer expert has 	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>been practising for</p> <ul style="list-style-type: none"> • How many staff is employed by the organization. <p>Discuss the topic of how to design a project with the invited mobile app developer expert. The mobile app developer expert needs to prepare a short introduction about their organization they can deliver to the learners at the beginning of their presentation. Ask the mobile app developer expert to bring with him/her materials that will support the presentation, for example relevant resources, photographs, records.</p> <p>A week before the presentation, provide learners with a copy of the case study you have prepared describing the mobile app developer expert's organization. Hold a discussion with the learners on the key points of how to design a project. 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 how to design a project that they can ask during the presentation. Ensure that learners bring their questions with them for the presentation.</p> <p>On the day of the presentation, introduce the mobile app developer expert to the learners. The mobile app developer expert needs to deliver the presentation to the learners about their organization and how their organization manages how to design a project. Following the presentation, ask selected learners to ask the questions they had devised. Encourage discussion about</p>		

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>the key points of how to design a project.</p> <p>Following the presentation, learners need to write up the answers to the questions their group had devised and submit these to you as part of their evidence.</p> <p>Demonstrate the materials needed for how to design a project. Enable learners to practice using the appropriate materials for how to design a project in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to design a project in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
LU4: Implement a Project	<p>Lead a brainstorm on how to implement a project. List the brainstorm ideas on a flipchart. If necessary, prompt learners to consider the following:</p> <ol style="list-style-type: none"> 1. Design Interface as per application requirements 2. Create database as per Entity Relationship diagram ERD 3. Develop an application as per design UML and ERD <p>Learners need to devise 10 quiz questions with answers based on how to implement a project. They must make sure their questions cover key topics for how to implement</p>	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>a project.</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 how to implement a project. 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>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>Demonstrate the materials needed for how to implement a project. Enable learners to practice using the appropriate materials for how to implement a project in a controlled</p>		

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to implement a project in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p>LU5: Test a Project</p>	<p>Deliver an illustrated presentation on how to test a project. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Perform validation technique as per project requirements 2. Test project as per Software Requirement Specification (SRS) document <p>Display a flip chart showing the following key question related to how to test a project:</p> <p style="text-align: center;"><i>‘What are the steps involved regarding test of the project’</i></p> <p>Give each learner a sheet of paper and asked them to write their name at the top. Explain to learners that they will be sharing their work with other learners.</p> <p>Ask learners to write silently for 3-5 minutes answering the question displayed on the flip chart. When learners have completed writing, instruct them to pass their paper to the</p>	<p>Practical Classrooms</p> <p>labs,</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>learner on their left. Each learner will read what their partner has passed to them and write a response. This will also be done silently.</p> <p>After another 2-3 minutes, instruct the learners to pass the paper to their left a second time. Repeat the same procedure, also done in silence.</p> <p>At the end of the activity, ask the learners to return the paper to the original writer. Allow learners a few moments to read over the responses to their writing.</p> <p>Ask learners to work in pairs to reflect on and discuss the responses to the question on the flip chart.</p> <p>When this activity is concluded, collect the papers and make copies for each learner.</p> <p>Demonstrate the materials needed for how to test a project. Enable learners to practice using the appropriate materials for how to test a project in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to test a project in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

Module 28: 0613001028 Develop Software Development Life Cycle (SDLC) for Apps Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p>LU 6: Execute a project</p>	<p>Invite an experienced colleague to deliver a presentation about how to execute a project. Ensure that the presentation addresses the following points:</p> <p>Deploy project in production environment as per client requirement.</p> <p>Perform user acceptance test as per client requirements</p> <p>Prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing key topics for how to execute a project. 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 how to execute a project. 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</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>key topics.</p> <p>End the group discussion activity with a summary.</p> <p>Demonstrate the materials needed for how to execute a project. Enable learners to practice using the appropriate materials for how to execute a project in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to execute a project in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

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Module 29: 0613001029 Apply Design Pattern for Android App

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p>LU1: Identify the Basic of Design Pattern for Android App</p>	<p>Deliver an illustrated presentation on how to Identify the Basic of Design Pattern for Android App. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Identify design pattern for android APP 2. Identify relevant design pattern as per requirement <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to Identify the Basic of Design Pattern for Android App. Go through all the key topics briefly and then allocate one key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</p> <p>After the discussion, begin the feedback session. Ask one</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>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 how to Identify the Basic of Design Pattern for Android App. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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>Demonstrate the materials needed for how to Identify the Basic of Design Pattern for Android App. Enable learners to practice using the appropriate materials for how to Identify the Basic of Design Pattern for Android App in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Identify the Basic of Design Pattern for Android App in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p>LU2:</p> <p>Implement Design Pattern for android app</p>	<p>Deliver an illustrated presentation on how to Implement Design Pattern for android app. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Build appropriate design pattern as per requirements 2. Implement selected design pattern as per structure <p>Learners need to devise 10 quiz questions with answers based on how to Implement Design Pattern for android app. They must make sure their questions cover key topics for how to Implement Design Pattern for android app.</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 how to Implement Design Pattern for android app. 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>The scorekeeper records 1 mark for a correct answer under the appropriate team’s score column. Play then passes to</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>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>Demonstrate the materials needed for how to Implement Design Pattern for android app. Enable learners to practice using the appropriate materials for how to Implement Design Pattern for android app in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Implement Design Pattern for android app in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		
<p>LU3: Test Design pattern for android App</p>	<p>Lead a discussion on how to Test Design pattern for android App. Encourage ALL trainees to participate in the discussion. Ensure that the discussion addresses the following points:</p> <ol style="list-style-type: none"> 1. Implement J-Unit Testing with MOCKITO for 	<p>Practical Classrooms</p> <p>labs,</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 29: 0613001029 Apply Design Pattern for Android App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>activity</p> <p>2. Implement fragment scenario testing for fragment</p> <p>Display a slide or flip chart with a key question relating to how to Test Design pattern for android App.</p> <p>Step 1 – Think Working on their own, each learner thinks about the question and makes notes of their responses or key points which they believe to be important.</p> <p>Step 2 – Pair For the next step, each learner pairs up with a partner. The two learners exchange their ideas and make further notes to add clarity to their own ideas.</p> <p>Step 3 – Share The final step is for you to invite different pairs to share the ideas they have discussed in response to the key question relating to how to Test Design pattern for android App.</p> <p>Demonstrate the materials needed for how to Test Design pattern for android App. Enable learners to practice using the appropriate materials for how to Test Design pattern for android App in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Test Design pattern for android App in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to</p>		

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	support their understanding.		

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Module 30: 0613001030 Develop Professional Android App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Apply Version Control System	<p>Deliver an illustrated presentation on how to apply version control. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Create repository in third party cloud platform (GitHub) for version controlling 2. Commit the code to the cloud for version control management as per specification 3. Create team in cloud for centralized Project <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to apply version control. Go through all the key topics briefly and then allocate one key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</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</p>	Practical labs, Classrooms	Learner Guide Handouts Videos Multi-media projector

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>learners. Ask the group to share the main points they have recorded for their key topic for how to apply version control. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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>Demonstrate the materials needed for how to apply version control. Enable learners to practice using the appropriate materials for how to apply version control in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to apply version control in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

Module 30: 0613001030 Develop Professional Android App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU2: Develop Android App using Web API's	<p>Lead a brainstorm on how to Develop Android App using Web API's. List the brainstorm ideas on a flipchart. If necessary, prompt learners to consider the following:</p> <ol style="list-style-type: none"> 1. Create new project in android studio 2. Create network layer between mobile and web API's 3. Integrate android app with Web API's for data communications <ul style="list-style-type: none"> - Check Web API's Compatibility - Verify Web API's working - Apply "Get" and "post" methods for communication with API's 4. Use Network communication libraries (Volley, Retrofit). <p>Learners need to devise 10 quiz questions with answers based on how to Develop Android App using Web API's. They must make sure their questions cover key topics for how to Develop Android App using Web API's.</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 how to Develop Android App using Web API's. 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</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 30: 0613001030 Develop Professional Android App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>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>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>Demonstrate the materials needed for how to Develop Android App using Web API’s. Enable learners to practice using the appropriate materials for how to Develop Android App using Web API’s in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Develop Android App using Web API’s in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

Module 30: 0613001030 Develop Professional Android App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU3: Develop Advance Interface Design	<p>Lead a discussion on how to develop advance interface design. Encourage ALL trainees to participate in the discussion. Ensure that the discussion addresses the following points:</p> <ol style="list-style-type: none"> 1. Develop design using up-to-date design software as per requirement 2. Select appropriate layout mode using Android Studio as per specification 3. Implement design for different screens using Android Studio as per requirement 4. Check Compatibility for portrait and landscape mode <p>Learners need to devise 10 quiz questions with answers based on how to develop advance interface design. They must make sure their questions cover key topics for how to develop advance interface design.</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 how to develop advance interface design. 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</p>	Practical labs, Classrooms	Learner Guide Handouts Videos Multi-media projector

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Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>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>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>Demonstrate the materials needed for how to develop advance interface design. Enable learners to practice using the appropriate materials for how to develop advance interface design in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to develop advance interface design in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

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Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Prepare test cases	<p>Deliver an illustrated presentation on how to prepare test cases. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Create functional test cases as per user requirements 2. Create non-functional test cases as per user requirements 3. Create unit test cases as per user requirements 4. Create system test cases as per specification 5. Create integration test case as per the required specification 6. Create regression test cases as per given requirements 7. Create beta test cases as per user requirements 8. Create interface test cases as per given design <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to prepare test cases. Go through all the key topics briefly and then allocate one</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</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 how to prepare test cases. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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>Demonstrate the materials needed for how to prepare test cases. Enable learners to practice using the appropriate materials for how to prepare test cases in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to prepare test cases</p>		

Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU2: Execute Test Cases	<p>Lead a brainstorm on how to execute test cases. List the brainstorm ideas on a flipchart. If necessary, prompt learners to consider the following:</p> <ol style="list-style-type: none"> 1. Perform functional testing as per user requirements 2. Perform non-functional testing as per user requirements 3. Perform unit test cases as per requirements 4. Perform system test cases as per specification 5. Perform integration test case as per the required specification 6. Perform regression test cases as per given requirements 7. Perform beta test cases as user requirements 8. Execute interface test cases as per given design. <p>Prepare either:</p> <ul style="list-style-type: none"> • A flip chart 	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<ul style="list-style-type: none"> • A PowerPoint slide • A handout <p>...showing key topics for how to execute test cases. 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 how to execute test cases. 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>Demonstrate the materials needed for how to execute test cases. Enable learners to practice using the appropriate materials for how to execute test cases in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to execute test cases in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their</p>		

Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	understanding.		
LU3: Comply with Privacy Policy of App	<p>Invite an experienced colleague to deliver a presentation about how to Comply with Privacy Policy of App. Ensure that the presentation addresses the following points:</p> <ol style="list-style-type: none"> 1. Comply with GDPR (General Data Protection Regulations) Policy 2. Ensure the Standards of Mobile App according to GDPR <p>Prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing key topics for how to Comply with Privacy Policy of App. 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 how to Comply with Privacy Policy of App. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified.</p>	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 31: 0613001031 Assure the Quality of Mobile App			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<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>Demonstrate the materials needed for how to Comply with Privacy Policy of App. Enable learners to practice using the appropriate materials for how to Comply with Privacy Policy of App in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Comply with Privacy Policy of App in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p> <p>.</p>		

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Module 32: 0613001032 Develop Professionalism Capable of Android Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
<p>LU1: Develop Employability Skills</p>	<p>Deliver an illustrated presentation on how to Develop Employability Skills. Ensure that the presentation focuses on the following:</p> <ol style="list-style-type: none"> 1. Develop technical introduction and related portfolio. 2. Participate in interpersonal activities <ul style="list-style-type: none"> - Group discussions - Team Competitions 3. Organize internal activities to improve employability skills 4. Develop a career goal <p>Learner need to prepare either:</p> <ul style="list-style-type: none"> • A flip chart • A PowerPoint slide • A handout <p>...showing the key topics about how to Develop Employability Skills. Go through all the key topics briefly</p>	<p>Practical labs, Classrooms</p>	<p>Learner Guide Handouts Videos Multi-media projector</p>

Module 32: 0613001032 Develop Professionalism Capable of Android Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>and then allocate one key topic 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 chart paper to record three main points from their discussions that relate to their key topic.</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 how to Develop Employability Skills. Discuss these main points briefly with the whole group. Learners should make additional notes on the flip chart 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>Demonstrate the materials needed for how to Develop Employability Skills. Enable learners to practice using the appropriate materials for how to Develop Employability Skills in a controlled environment.</p> <p>Learners must be able to practice and develop their</p>		

Module 32: 0613001032 Develop Professionalism Capable of Android Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	knowledge and skills relating to how to Develop Employability Skills in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU2: Develop Business Freelance	<p>Lead a discussion on how to Develop Freelance Business. Encourage ALL trainees to participate in the discussion. Ensure that the discussion addresses the following points:</p> <ol style="list-style-type: none"> 1. Develop a profile on Up work/Fiver with portfolio. 2. Develop business communication skills required for android development field <ul style="list-style-type: none"> - Proposals - e-mails 3. Tools like Skype, Slack & Zoom etc. 4. Schedule a mockup client /freelancer interview session <p>Learners need to devise 10 quiz questions with answers based on how to Develop Freelance Business. They must make sure their questions cover key topics for how to Develop Freelance Business.</p> <p>Issue each learner with 10 blank cards. Each learner should</p>	Practical Classrooms labs,	Learner Guide Handouts Videos Multi-media projector

Module 32: 0613001032 Develop Professionalism Capable of Android Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>number the cards and write their name on one side with a question about how to Develop Freelance Business. 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>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>Demonstrate the materials needed for how to Develop Freelance Business. Enable learners to practice using the appropriate materials for how to Develop Freelance Business in a controlled environment.</p> <p>Learners must be able to practice and develop their</p>		

Module 32: 0613001032 Develop Professionalism Capable of Android Development			
Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	knowledge and skills relating to how to Develop Freelance Business in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU3: Expand Professional Network	<p>Invite an experienced colleague to deliver a presentation about how to Expand Professional Network. Ensure that the presentation addresses the following points:</p> <ol style="list-style-type: none"> 1. Create a Linked-In profile and expand professional network. 2. Create a Mobile App Development blog and share it online. 3. Create a Professional Resume with portfolio, experience and blogging info. <p>Prepare a short case study giving background information of the mobile app developer expert. The information should include:</p> <ul style="list-style-type: none"> • The mobile app developer expert's name • Address of the mobile app developer expert's organization • How long the mobile app developer expert has been practising for • How many staff are employed by the organization. <p>Discuss the topic of how to Expand Professional Network</p>	Practical Classrooms	labs, Learner Guide Handouts Videos Multi-media projector

Module 32: 0613001032 Develop Professionalism Capable of Android Development

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
	<p>with the invited mobile app developer expert. The mobile app developer expert needs to prepare a short introduction about their organization they can deliver to the learners at the beginning of their presentation. Ask the mobile app developer expert to bring with him/her materials that will support the presentation, for example relevant resources, photographs, records.</p> <p>A week before the presentation, provide learners with a copy of the case study you have prepared describing the mobile app developer expert's organization. Hold a discussion with the learners on the key points of how to Expand Professional Network. 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 how to Expand Professional Network that they can ask during the presentation. Ensure that learners bring their questions with them for the presentation.</p> <p>On the day of the presentation, introduce the mobile app developer expert to the learners. The mobile app developer expert needs to deliver the presentation to the learners about their organization and how their organization manages how to Expand Professional Network. Following the presentation, ask selected learners to ask the questions they had devised. Encourage discussion about the key points of how to Expand Professional Network.</p>		

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	<p>Following the presentation, learners need to write up the answers to the questions their group had devised and submit these to you as part of their evidence.</p> <p>Demonstrate the materials needed for how to Expand Professional Network. Enable learners to practice using the appropriate materials for how to Expand Professional Network in a controlled environment.</p> <p>Learners must be able to practice and develop their knowledge and skills relating to how to Expand Professional Network in an appropriate practical setting. Ensure that learners have the opportunity to ask questions to support their understanding.</p>		

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 8th Grade or equivalent.</p>
<p>4. How can I progress in my educational career after attaining this certificate?</p>	<p>You shall be eligible to take admission in the National Vocational Certificate Level-4 in Android application developer. You shall be able to progress further to National Vocational Certificate Level-4 in Android application developer (Supervisor); and take admission in a level-5, DAE or equivalent course. 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>

8. What is the duration of this course?	The duration of the course work is 1200 hours
9. What are the class timings?	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.
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 android application development industry which comprises of development of applications for play store as well as testing and optimization of the apps.
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 language of this course is 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 system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. 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/ software house related to android application development and you can work as freelancer as well after the completion of the course. You may need additional skills on entrepreneurship to support your initiative.

Test Yourself (Multiple Choice Questions)

MODULE 26

- Question 51** What are the best key features to Develop a project proposal
- A Highlighting the required features, cost efficient, deployment should be fast
 - B Explaining cost & time constraints of the app, upgrading the application
 - C Adding new features, cost and time will be good than the others
 - D Highlighting the required features, Explaining cost & time constraints, Evaluating the drafted proposal
- Question 52** What Are The Best App Marketing Strategies
- A Research target market, reach your audience with social networks, make your app visible in app store etc.
 - B Asking people for the application trending
 - C Cloning the applications
 - D None of the above

Question 53 Is the target audience is important for marketing?

A True

B False

C

D

Question 54 Which one of the following is a functional requirement?

A Maintainability

B Portability

C Robustness

D None of the mentioned

Question 55 Which of the following statements explains portability in non-functional requirements?

- A It cannot be enhanced by using languages, OS' and tools that are universally available and standardized
- B The ability of the system to behave consistently in a user-acceptable manner when operating within the environment for which the system was intended
- C It is a degree to which software running on one platform can easily be converted to run on another platform
- D None of the mentioned

MODULE 27

Question 56 What does the below symbol denotes



- A I/O
- B Flow
- C Terminal
- D Decision

Question 57 Which box that can represent two different conditions.

A Rectangle

B Diamond

C Circle

D Parallelogram

Question 58

1. What will be the value of s if n=127?

```
Read n
i=0,s=0
Function Sample(int n)
while(n>0)
r=n%10
p=8^i
s=s+p*r
i++
n=n/10
End While
Return s;
End Function
```

A 27

B 127

C 87

D 120

Question 59 How many times the following loop be executed?

```
{  
...  
ch = 'b';  
while(ch >= 'a' && ch <= 'z')  
ch++;  
}
```

A 0

B 25

C 26

D 1

Question 60 Which of the following is incorrect?
Algorithms can be represented:

A as pseudo codes

B as syntax

C as programs

D as flowcharts

MODULE 28

Question 61 What is the fundamental objective of system analysis

- A understand computer hardware
- B train managers in mathematical analysis
- C study and understand a complex system and modify it in some way
- D run simulation programmers

Question 62 Which one of the following is not stage of SDLC?

- A System analysis
- B Problem identification
- C System Design
- D Feasibility study

Question 63 What is the first step in Software Development Life Cycle(SDLC)

A Preliminary investigation and Analysis

B System Design

C System Testing

D Coding

Question 64 What is the detailed study of existing system is referred to as

A System Planning

B System Analysis

C Feasibility Study

D Design DFD

Question 65 What does Prototyping aims at :

- A program logic
- B planning of dataflow organization
- C end user understanding and approval
- D none of these

MODULE 29

Question 66 Which of the following pattern is used to separate application's concerns?

- A Visitor Pattern
- B MVC Pattern
- C Business delegate pattern
- D Composite entity pattern

Question 67 Which type of design patterns provides a way to create objects while hiding the creation logic, rather than instantiating objects directly using new operator?

- A Behavioral Design Pattern
- B Structural Design Patterns
- C Creational Design Patterns
- D J2EE Design Patterns

Question 68 Which of the following is the correct list of entities of DAO pattern?

- A Data Access Object Interface, Model Object or Value Object
- B Data Access Object Interface, Data Access Object concrete class
- C Data Access Object concrete class, Model Object or Value Object
- D Data Access Object Interface, Data Access Object concrete class, Model Object or Value Object

Question 69 Which of the following is correct about Structural design patterns?

- A These design patterns are specifically concerned with communication between objects
- B These design patterns provide a way to create objects while hiding the creation logic, rather than instantiating objects directly using new operator.
- C These design patterns concern class and object composition. Concept of inheritance is used to compose interfaces and define ways to compose objects to obtain new functionalities.
- D None of the above.

Question 70 Where does view corresponds to In model-view-controller (MVC) architecture?

- A Interface layer
- B Data-access layer
- C Domain object layer
- D Business-logic layer

Question 71 Before you install Git, which of the following prerequisite products must be present and configured on your local OS?

- A Jakarta Enterprise Edition web profile compliant server
- B Java Development Kit 1.8 or newer
- C Apache Maven
- D Nothing is required for the installation

Question 72 Which of the following is not a Git configuration scope?

- A Local
- B User
- C System
- D Global

Question 73 Which command should you use to initialize a new Git repository?

A GIT Bash

B GIT install

C GIT INIT

D GIT start

Question 74 Can we change the package name in the existing android studio project

A Yes

B No

C

D

Question 75 Which is correct format of writing JSON name/value pair

A 'name : value'

B name = 'value'

C name = "value"

D "name" : "value"

MODULE 31

Question 76 What does testing helps to achieve?

A Fix defect

B Improve Quality

C Measure Quality

D All above

Question 77 Which of the following categories non-functional test does not belong to??

- A Performance
- B Usability and Security
- C State Level Transition
- D All of the above

Question 78 Which of the following is a form of functional testing?

- A Security level testing
- B Boundary value analysis
- C Performance testing
- D Usability testing

Question 79 Which of the below is not a Fundamental Test Process?

- A Test Planning

- B Requirement Analysis
- C implementation and Execution
- D Evaluating test criteria and reporting

Question 80 When would the testing have been stopped?

- A When all the tests run
- B When the faults have been fixed
- C When the time completed
- D When all the risk are resolved

MODULE 32

Question 81 What are foundational Skills?

- A Arrive to work on time, or early

B Exert high levels of effort and perseverance

C Be flexible and adaptable

D ALL OF THE ABOVE

Question 82 Where would one use leadership skills

A to coach and mentor others

B to serve on work committees

C to act professionally

D to contribute to team goals

Question 83 An Inbox is where you can find

A New email

B Sent email

C Deleted email

D Archived email

Question 84 Which is the part of an e-mail message that contains the address of the sender and recipient?

A Header

B Footer

C Body

C Signature

Question 85 Skype does not operate on which platform?

A Android

B Linux

C Windows

D Blackberry

Answers

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