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सत्यमेव जयते
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MINISTRY OF SKILL DEVELOPMENT
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Facilitator Guide



Sector
IT-ITeS

Sub-Sector
Software Product Developer

Occupation
Product Development and Delivery

Reference ID: SSC/Q6702, Version 3.0
NSQF level 5

Software Developer Product Development

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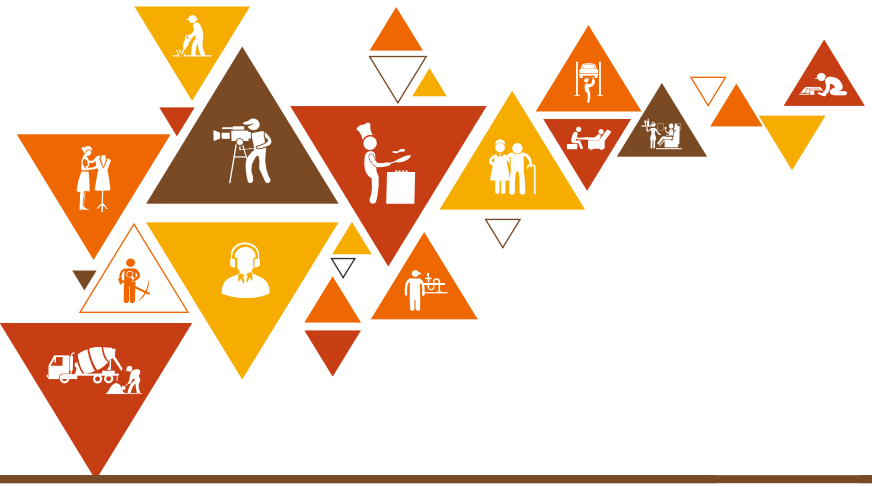
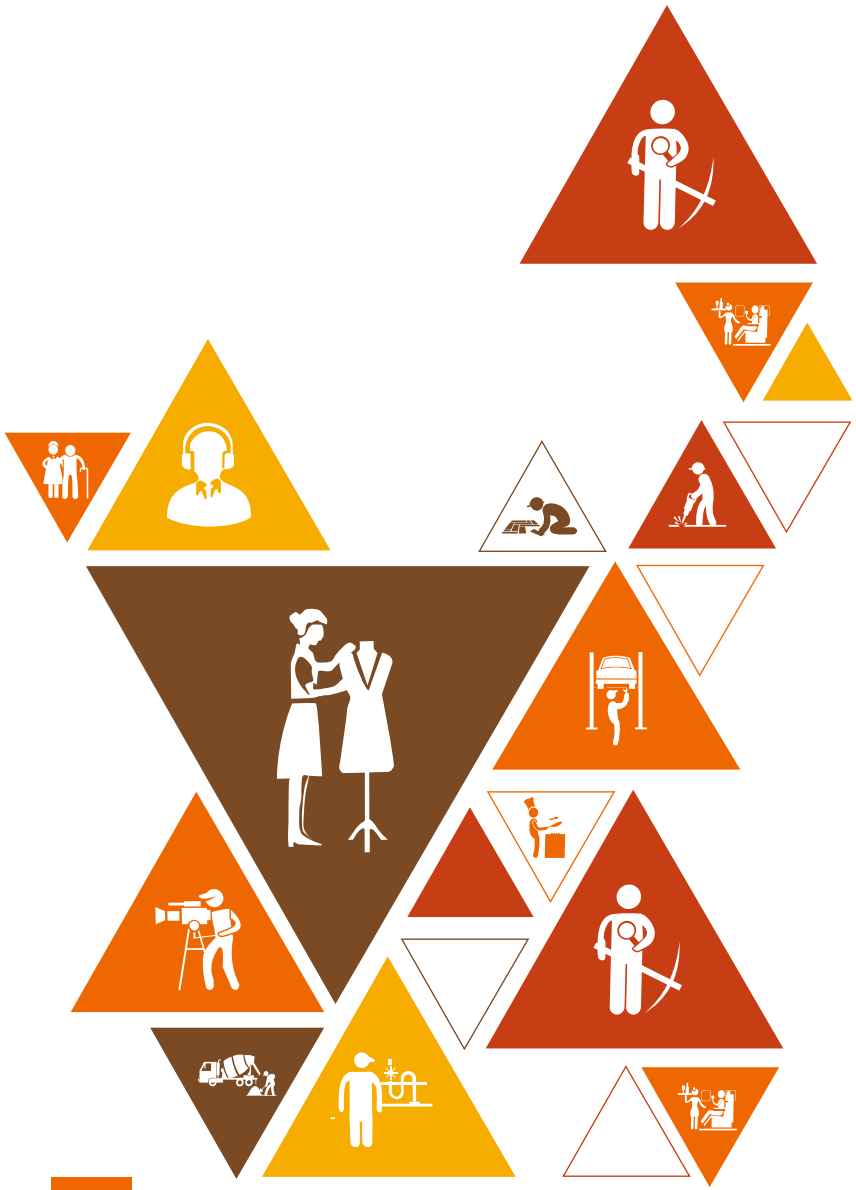


"Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission."

Shri Narendra Modi
Prime Minister of India



Acknowledgements

IT-ITeS Sector Skils Council NASSCOM would like to express its gratitude to all the individuals and institutions who contributed in different ways towards the preparation of this “Facilitator Guide ”. Without their contribution it would not have been completed. Special thanks are extended to those who collaborated in the preparation of its different modules. Sincere appreciation is also extended to all who provided peer review for these modules. The preparation of this Guide would not have been possible without the IT - ITeS support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the Industry.

This Guide is dedicated to the aspiring youth who desire to achieve special skills which will be a lifelong asset for their future endeavours.

About this Book

The Facilitator Guide is designed for the Trainers to enable training for a specific job role and enhance the quality of executing the training program. This particular Facilitator Guide is designed for enabling the training program for the job role of "Software Developer Product Development" in the IT-ITeS Sector.

This course is aligned to Qualification Pack, Software Developer Product Development, Reference ID: SSC/Q6702.

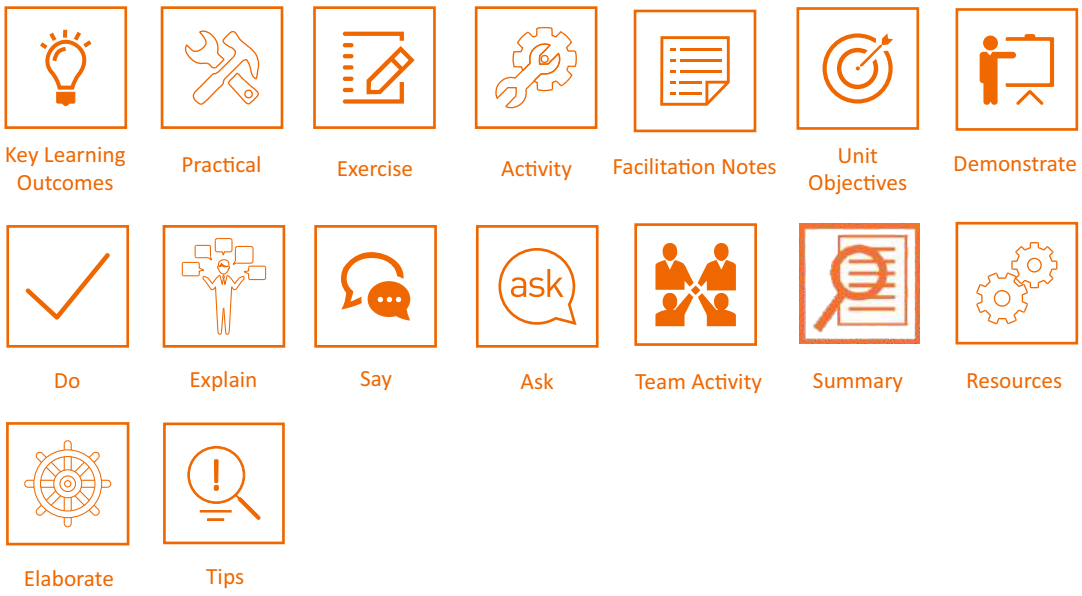
This Qualification pack is developed by IT-ITeS Sector Skills Council NASSCOM. This course encompasses all 7 National Occupational Standards (NOS).

Each unit starts with learning objectives, followed by relevant activities and corresponding training methodology. Upon successful completion of this course, the participant will be able to:

1. SSC/N0502: Develop software code to specification
2. SSC/N9014: Maintain an inclusive, environmentally sustainable workplace
3. DGT/VSQ/N0102 Employability and Entreprenuership Skills (60 Hours)

Besides, it has been endeavored to follow the facilitator guide guidelines prescribed by the National Skill Development Corporation.

Symbols Used



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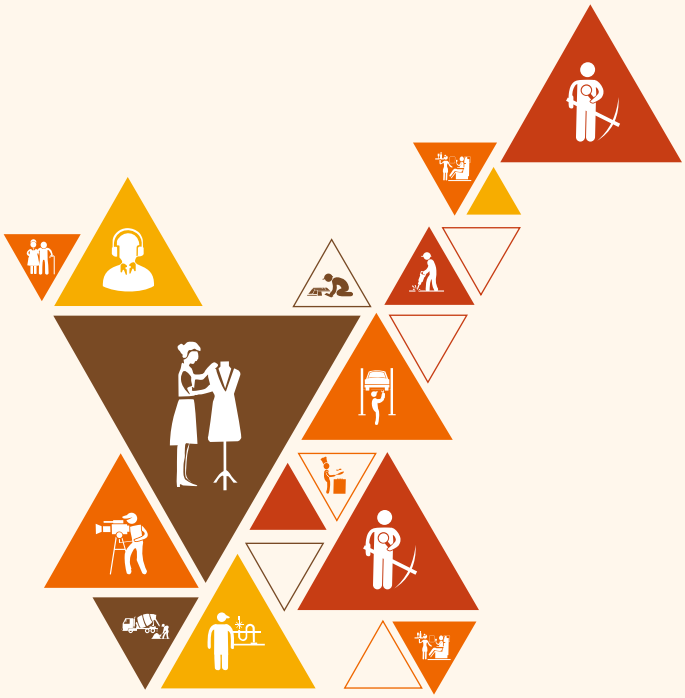
1. IT-ITeS/IT Services Industry – An Introduction

Unit 1.1 - Introduction to IT-ITeS industry and its Various Sub-Sectors

Unit 1.2 - Career Path for a Software Developer



Bridge Module

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Comprehend various delivery models used in the IT-Support services industry

UNIT 1.1: Introduction to IT-ITeS industry and its Various Sub-Sectors

Unit Objectives

At the end of this unit, the participant will be able to:

1. Discuss the relevance of the IT-ITeS sector

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- Start the class by saying, "This training program is developed to impart specific knowledge and skills relevant to the job required to be performed as a "Software Developer", in the " IT-ITeS" sector.
- Talk about the Qualification Pack (QP), and National Occupational Standards (NOS).
- List the compulsory NOSs to the QP " Software Developer."
- Say, "Before we start the program let's play a small game."

Group Activity

Objective	The purpose of this activity is to connect with the course mates
Materials required	Book (for passing)

Steps/procedure	• Welcome the new participants by giving own introduction • Make the trainees stand in a circle, close enough to the person on each side of them so that they can pass the book quickly. • Say 'Stop' when it is least expected. At that time, the trainee holding the book introduces himself/herself while saying his/her names and a little additional information such as favorite hobbies, what software they like, etc. • The winner of the game should stand and introduce himself/herself at the end of the game. • At last, thank the participants for their participation.
Conclusion / what has been achieved	This activity helps the participants to know each other and also allows them to feel comfortable.

Explain

- Explain the IT-ITeS industry and its subsectors with the help of Fig. 1.1.2 given in Participant Handbook.
- Explain the various Delivery Models used in the IT/ Software Products Development using the figure given in Participant Handbook (Fig 1.1.4).

Elaborate

- Elaborate on the following topics:
  - Business Process Management (BPM) using the figure given in Participant Handbook (Fig 1.1.5)
  - Engineering Services Outsourcing (ESO) using the figure given in Participant Handbook (Fig 1.1.6)
  - Knowledge Process Outsourcing (KPO) using the figure given in Participant Handbook (Fig 1.1.7 and 1.1.8)
  - Legal Process Outsourcing (LPO) using the figure given in Participant Handbook (Fig 1.1.6 and 1.1.9)
  - Key emerging trends in IT- ITeS industry using the figure given in Participant Handbook (Fig 1.1.10)

Notes for Facilitation

- Examine participants about their expectations from this program.
- Inquire participants if they have any doubts. Then, encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 1.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 1.1.1
  2. Reference given in 1.1.3
  3. Reference given in 1.1.2
  4. Reference given in 2.1.
  5. Reference given in 1.1.4
  6. Reference given in 1.1.4
  7. Reference given in 1.1.5

  Answer to Question II:

  1. All of the above
  2. IT Service

  Answer to Question III:

  1. Engineering Services Outsourcing (ESO)
  2. BPM, research, and analysis
  3. Information Technology
  4. Operational efficiency

Unit 1.2: Career Path for a Software Developer

Unit Objectives

At the end of this unit, the participant will be able to:

1. Identify the career path for a software developer

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Ask

- Start the class by asking a few questions on IT sector and its subsector and give participants the chance to guess before revealing the correct answer.
- Do you know about the software development?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Say

- “Software development refers to a group of computer science activities concerned with the process of creating, designing, deploying, and supporting software. Surprisingly, the work is not limited to coders or a development team. As part of their jobs, scientists, device fabricators, and hardware designers create code and algorithms.”
- "This unit will help you understand the career path for a software developer.”

Explain

- Explain the Software Development?

Explain roles & responsibilities of software developers with the help of figure (Fig 1.2.1).

Explain the key competencies of software developers with the help of figure (Fig 1.2.2).

Explain career path for software developer with the help of table (Table 1.2.1).

Elaborate

- Elaborate the following topics –
  - Computer and Information Research Scientists and System Managers
  - Computer Hardware Engineers and Programmers
  - Computer Network Architects and Support Specialists
  - Information Security Analysts
  - Mathematicians and Statisticians
  - Postsecondary Teachers
  - Web Developers

Summarize

- Summarize the session.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 1.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  - software developer, or senior software developer
  - Management
  - Reference
  - IT project managers

  Answer to Question II:

  - Reference given in 1.2.4
  - Reference given in 1.2.2
  - Reference given in 1.2.3
  - Reference given in 1.2.4

  Answer to Question III:

  - Interpersonal skills
  - Junior developer

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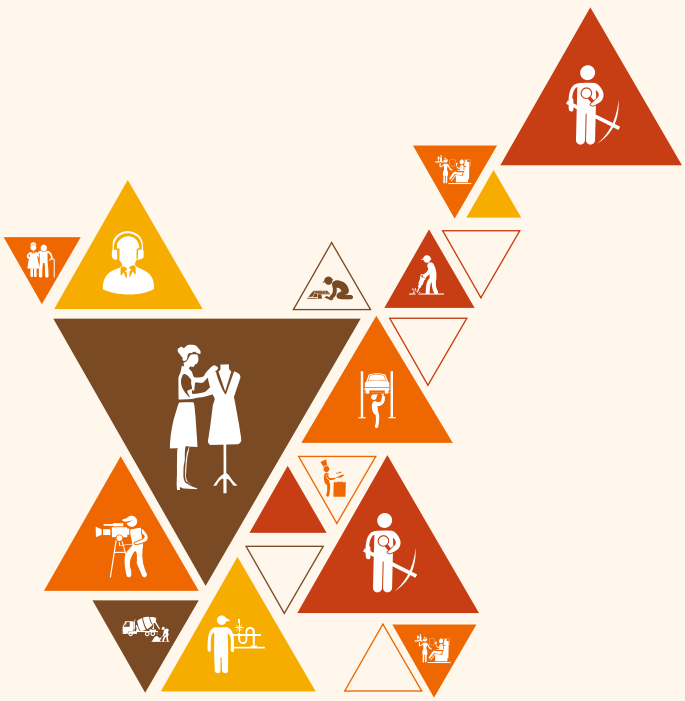
2. Software Development- An Introduction

Unit 2.1 - Software Development & IT Services



Bridge Module

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Discuss the importance of the IT software services sector in business

Unit 2.1: Software Development & IT Services

Unit Objectives

At the end of this module, the participant will be able to:

1. List deployment issues of high capital investments, continuous business availability, turnaround time, communication costs, etc. in the establishment of IT-enabled services

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- Start the class by asking a few questions on career path related to software developer and give participants the chance to guess before revealing the correct answer.
- Ask them to name a few emerging trends of IT sector.
- Do you have an idea about what kind of application used in software development?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Say

- ”In the last unit, we gained an understanding of the job role and responsibilities of an software developer.”
- “In today's session, we will learn more about the software development & IT services.”

Explain

- Explain the importance of IT software services sector (Fig 2.1.1).
- Explain different types of application used in software development with the help of figure given in Participate Handbook (Fig 2.1.2).
- Explain the IT-enabled services with the help of figure given in Participate Handbook (Fig 2.1.4).
- Explain the opportunities and challenges in IT/ITeS enabled services with the help of figure given in Participate Handbook (Fig 2.1.6 and Fig 2.1.7).

Elaborate

- Elaborate on the following topics:
  - Technologies involved in IT sector
  - Deployment issue using the figure given in PH (Fig 2.1.8).
  - Six reasons for application deployment failure

Ask

- What are the types of application used in software development?
- Why the important IT enabled services?

Notes for Facilitation

- Note down the responses on the whiteboard given by the students.

Summarize

- Summarize the session by explaining IT software services.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 2.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  a. Software tools

  b. Information technology

  c. Application software developers

  d. communications

  e. IT enabled services

  Answer to Question II:

  1. Reference given in 2.1.7
  2. Reference given in 2.1.6
  3. Reference given in 2.1.4
  4. Reference given in 2.1.2
  5. Reference given in 2.1.5

  Answer to Question III:

  1. Application programming interface
  2. Cutthroat competition

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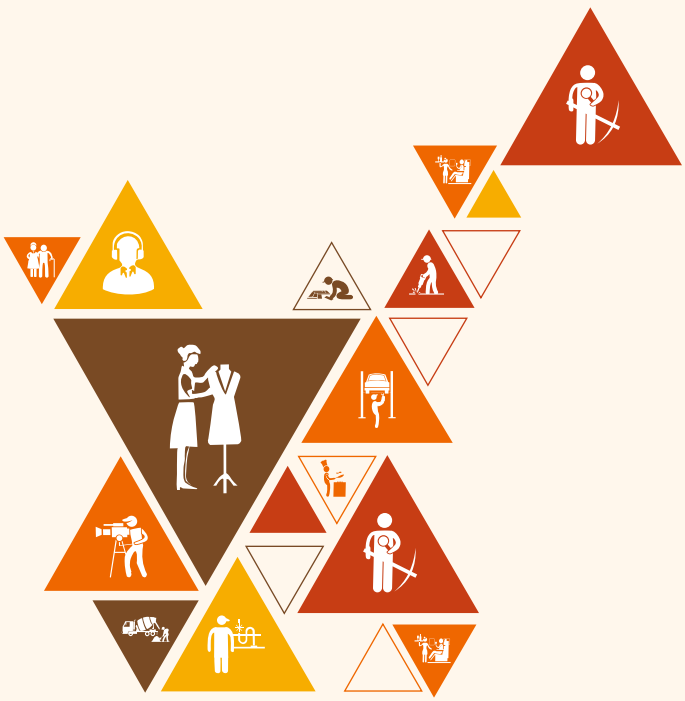
3. Process of Software Development

Unit 3.1 - Software Development Lifecycle



SSC/N0502

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Analyze users' needs to design, test, and develop software as per requirement
2. Evaluate various steps to design models and approaches to facilitate software development process

Unit 3.1: Software Development Lifecycle

Unit Objectives

At the end of this module, the participant will be able to:

1. List the phases of the software development lifecycle
2. Discuss the differences between top-down and bottom-up design approaches

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Welcome and greet the students.
- Discuss the important topics from the previous modules.

Say

- "So, let's start today's session with software development process."
- Can anyone tell me few steps of software development process."

Explain

- Explain the software development process.
- Explain the SDLC phases with the help of table given in Participant Handbook (Table 3.1.1).
- Explain the top-down design approach and its advantage and disadvantage with the help of figures given in Participant Handbook (Fig 3.1.1 and Fig 3.1.2)
- Explain the working ways on top-down programming with the help of figure given in Participant Handbook (Fig 3.1.3).

- Explain the bottom-up design approach and its advantage.
- Explain the working ways on bottom-up programming with the help of figure given in Participant Handbook (Fig 3.1.4).

Demonstrate

- Demonstrate Process of Software Development with the help of the AV link below:
  https://www.youtube.com/watch?v=9ir7wv2xNDI

Ask

- What do you understand about top-down programming?
- How Bottom-up programming is different from Top-down programming?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Explain

- Explain differences between top-down design and bottom-up design with the help of figure given in Participant Handbook (Table 3.1.2).
- Explain the types of project test design techniques with the help of figure given in Participant Handbook (Fig 3.1.5).

Elaborate

- Elaborate the topics below:
  - Key principles of developing an effective strategy for a project with the help of figure given in Participant Handbook (Fig 3.1.6).
  - Semantic Errors in a program

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 3.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 3.1.1
  2. Reference given in 3.1.5
  3. Reference given in 3.1.4
  4. Reference given in 3.1.4
  5. Reference given in 3.1.3

  Answer to Question II:

  a. Top-down programming
  b. C or Java
  c. SDLC
  d. Software Development Life Cycle (SDLC)

  Answer to Question III:

  a. Set of programs, documentation & configuration of data b) C or Java
  b. Dependence
  c. Project scheduling

QR Code

Scan the QR Code to watch the related video

youtu.be/9ir7wv2xNDI

Unit 3.1 Software Development Lifecycle

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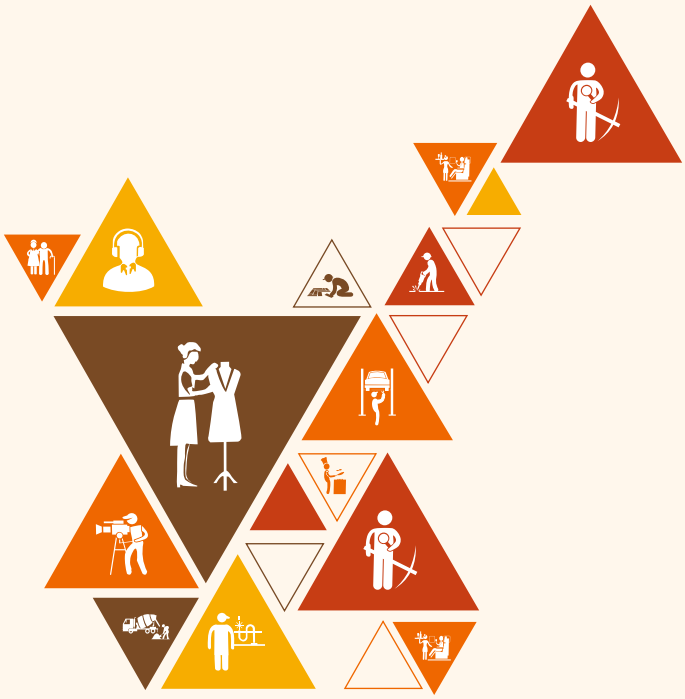
4. Process of Application Management

Unit 4.1 - Quality Attributes of Software Requirements Specification

Unit 4.2 - Custom and Rapid Application Software



SSC/N0502

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Use proper application of scripting language to automate tasks and write simple programs
2. List software quality attributes and characteristics of a good SRS

Unit 4.1: Quality Attributes of Software Requirements Specification

Unit Objectives

At the end of this module, the participant will be able to:

1. Identify different techniques used for requirements analysis

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Welcome and greet the students.
- Begin the session with a brief recapitulation of the previous session.

Say

- Say that, "So, let's start today's session. In this module, we are going to discuss the process of Application Management."
- "Can you tell me what is Software Requirements Specification?"

Explain

- Explain the software requirements specification with the help of figure given in Participant Handbook (Fig 4.1.1).
- Explain the goals for good software requirements specification with the help of figure given in Participant Handbook (Fig 4.1.2).
- Explain the software requirements specifications characteristics with the help of figure given in Participant Handbook (Fig 4.1.3).
- Explain the quality characteristics of a good SRS with the help of figure given in Participant Handbook (Fig 4.1.4).
- Explain the SRS document with the help of figure given in Participant Handbook (Fig 4.1.5).

Elaborate

- Elaborate the topics below:
  - Rules & guidelines for SRS documents with the help of figure given in Participant Handbook (Fig 4.1.6)
  - Standard structure for SRS documents and its components with the help of figure given in Participant Handbook (Fig 4.1.7).

Ask

- What do you understand performance requirements?
- What is the purpose of external interface in SRS document?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Explain

- Explain the structured design and its analysis tools with the help of figure given in Participant Handbook (Fig 4.1.8).

Demonstrate

- Show the HIPPO Diagram from Participant Handbook (Fig. 4.1.12)

Elaborate

- Elaborate the tools used for Structured Analysis:
  - Data Flow Diagrams (DFD)
  - Structure Charts
  - HIPO Diagram
  - Structured English
  - Pseudo code
  - Decision table
  - ER Diagram
  - Data Dictionary
  - Context Diagrams
  - State Transition Diagram
  - Flowcharts
  - Event Lists

Activity

Objective	The purpose of this activity is to understand the Structured English analysis tool.
Materials required	Pen and paper or laptop/computer
Steps / procedure	• This is a skill practice/computer lab activity. • Ask the participants to write the procedure to authentication customer in the online shopping environment. • Participant can take help from the Participant Handbook (refer section 7.1.4) • Give 5-10 minutes to complete the activity. • Ask the participants to show their answers to the class

Conclusion / what has been achieved	This activity will help them to learn the process of developing algorithm.

Ask

- What is structured english analysis tool ?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Activity

Objective	The purpose of this activity is to understand the Pseudo Code analysis tool.
Materials required	Pen and paper or laptop/computer
Steps / procedure	• This is a skill practice/computer lab activity. • Ask the participants to write a program to print Fibonacci up to n numbers. • Instruct the participant to note down the commands and steps in their notebook before practically working on the software. • Participant can take help from the Participant Handbook (refer section 7.1.4). • Give 5-10 minutes to complete the activity. • Ask the participants to run the program and show the answer.
Conclusion / what has been achieved	This activity will help them to learn Pseudo Code analysis tool.

Ask

- What is the difference between structured english and pseudo code analysis tool?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 7.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 4.1.4
  2. Reference given in 4.1.4
  3. Reference given in 4.1.1
     a. Reference given in 4.1.3
     b. Reference given in 4.1.4
     c. Reference given in 4.1.4
     d. Reference given in 4.1.4

- Answer to Question II:

  a. DFD (data flow diagram), DFD

  b. Software requirements specification (SRS)

  c. use case diagram

  d. Ranked

  Answer to Question III:

  1. IEEE

  2. Data flow diagram

Unit 4.2: Custom and Rapid Application Software

Unit Objectives

At the end of this module, the participant will be able to:

1. Discuss the primary differences between custom application development and rapid application development

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- "We have learned Software Requirements Specification in previous section. In this section we will learn about Custom and Rapid Application Software."
- "The process of designing, creating, and deploying custom software applications for specific users is known as custom application development and Rapid Application Development (RAD) is a development model that favors rapid prototyping and feedback over lengthy development and testing cycles. Now, learn more about them."

Explain

- Explain the custom application development and it is benefits with the help of figure given in Participant Handbook (Fig 4.2.1).
- Explain the customer software development pros and cons with the help of figure given in Participant Handbook (Fig 4.2.2).
- Explain tips for selecting a custom software development company with the help of figure given in Participant Handbook (Fig 4.2.3).
- Explain 5 best practices for developing custom software with the help of figure given in Participant Handbook (Fig 4.2.4).
- Explain the qualities of custom software development team with the help of figure given in Participant Handbook (Fig 4.2.5).
- Explain the rapid application development.

Demonstrate

- Demonstrate "Structured Design Analysis and Custom & Rapid Application Development" with the help of the AV link below:
  https://www.youtube.com/watch?v=fvKMBzefA_E

Elaborate

- Elaborate the topics below:
  - Benefits of rapid application development using the figure given in Participant Handbook (Fig 4.2.6).
  - Four phases of RAD using the figure given in Participant Handbook (Fig 4.2.7).

Ask

- What do you know about object-oriented design?
- What do you understand by UML (Unified Modelling Language)?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Explain

- Explain the object-oriented design and its advantages with the help of figure given in Participant Handbook (Fig 4.2.8).
- Explain the UML (Unified Modelling Language).
- Explain the goal and building blocks of UML.
- Explain the UML diagrams.

Elaborate

- Elaborate the UML Diagrams:
  - Class diagram and its purpose
  - Object diagram and its purpose with the help of figure given in Participant Handbook (Fig 4.2.10)
  - Component Diagram and its purpose with the help of figure given in Participant Handbook (Fig 4.2.11)
  - Sequence diagram and its purpose
  - Collaboration diagram and its purpose
  - Activity diagram and its purpose
  - State-chart diagram and its purpose
  - Deployment diagram and its purpose and its purpose with the help of figure given in Participant Handbook (Fig 4.2.12)
  - Use case diagram and its purpose

Activity

Objective	The purpose of this activity is to learn how to develop the Sequence diagram
Materials required	Pen and paper
Steps / procedure	• Ask the participants to make a sequence diagram on the ATM process. • Ask the participant to take the help of Participant Handbook and refer section 7.2.4 • Give 5-10 minutes to complete the activity.
Conclusion / what has been achieved	This activity will help them to understand the working of Sequence diagram in software development process.

Ask

- What is the purpose of sequence diagram?

Notes for Facilitation

- Write down the response on the board.

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 7.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 4.2.4
  2. Reference given in 4.2.4
  3. Reference given in 4.2.3
  4. Reference given in 4.2.2

  Answer to Question II:

  a. State chart diagrams
  b. Activity diagrams
  c. sequence diagram
  d. Object oriented

  Answer to Question III:

  a. specify required services for types of objects
  b. Use case

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youtu.be/fvKMBzefA_E

Unit 4.1 Quality Attributes of Software Requirements Specification

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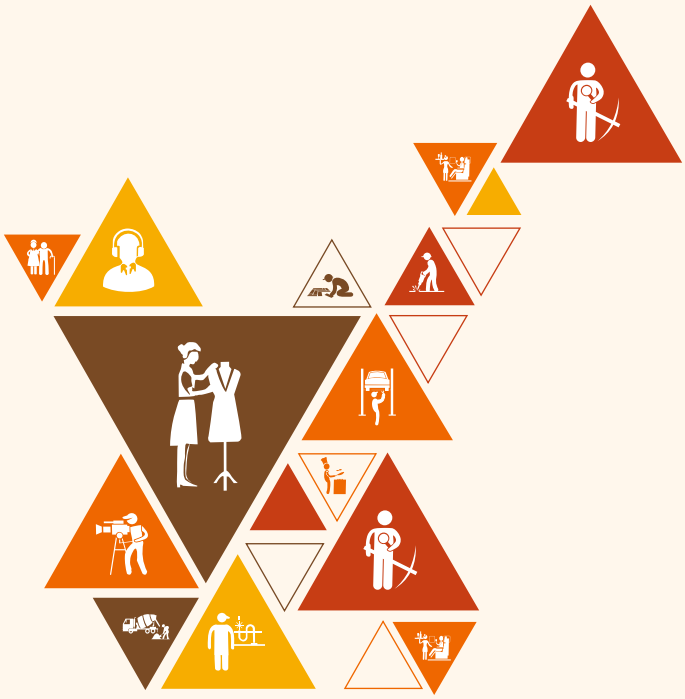
5. Concept of Re-usable Code Development

Unit 5.1 - Software Testing



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Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Discuss about manual and automated testing process
2. Examine the conversion process of specifications into code to meet the requirements

Unit 5.1: Software Testing

Unit Objectives

At the end of this module, the participant will be able to:

1. Discuss validation and verification components covered under software testing
2. List the components of a test plan

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Begin the session with a brief recapitulation of the previous session.

Say

- "So, let's start today's session. We have already learned about SDLC. In this module, we are going to discuss the process of software testing."

Ask

- What do you know about SDLC?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Explain

- Explain the software validation.
- Explain the different types of software validation with the help of figure given in Participant Handbook (Fig 5.1.1).
- Explain the software verification.
- Explain the methods of software verification.

Do/Demonstrate

- ·Demonstrate Software Testing and validation with the help of AV link – https://www.youtube.com/watch?v=jDI4wt6W5To

Elaborate

- Elaborate the methods of software verification:
  - Peer reviews
  - Walk through
  - Inspections

Ask

- What is the difference between software validation and verification?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Explain

- Explain the difference between software validation and verification with the help of table given in Participant Handbook (Table 5.1.1).
- Explain the software testing and its process with the help of figure given in Participant Handbook (Fig 5.1.4).
- Explain the 7 phases of software testing with the help of figure given in Participant Handbook (Fig 5.1.5).
- Explain the importance of software testing.

Elaborate

- Elaborate the topics below:
  - Components of test plan using the table given in Participant Handbook (Table 5.1.2)
  - Steps to develop a test plan for the software using the figure given in Participant Handbook (Fig 5.1.6)
  - Different sections of a Test Plan
  - Test plan identifiers using the table given in Participant Handbook (Table 5.1.3)

Ask

- What is the test matrix?
- What is the purpose of environment table components in a test plan?

Notes for Facilitation

- Write down the responses on the board.

Explain

- Explain the test cases and its parameters with the help of figure given in Participant Handbook (Fig 5.1.7).
- Explain the ways to write a good test case.
- Explain the testing approaches.

Elaborate

- Elaborate the topics below:
  - Black-box testing using the figure given in Participant Handbook (Fig 5.1.9)
  - White-box testing using the figure given in Participant Handbook (Fig 5.1.10)
  - Testing levels
  - Testing documentation at different stages

Ask

- What are the characteristics of a good test case?
- What is the difference between black-box testing and white-box testing?

Notes for Facilitation

- Write down the responses on the board.

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 5.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

Answer to Question I:

1. Reference given in 5.1.5
2. Reference given in 5.1.6
3. Reference given in 5.1.5
4. Reference given in 5.1.3

Answer to Question II:

a. Software testing

b. Peer-review method

c. Software verification

Answer to Question III:

a. Project Initiation Note [PIN]

b. Evaluating deliverable to find errors

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Concept of Re usable Code Development

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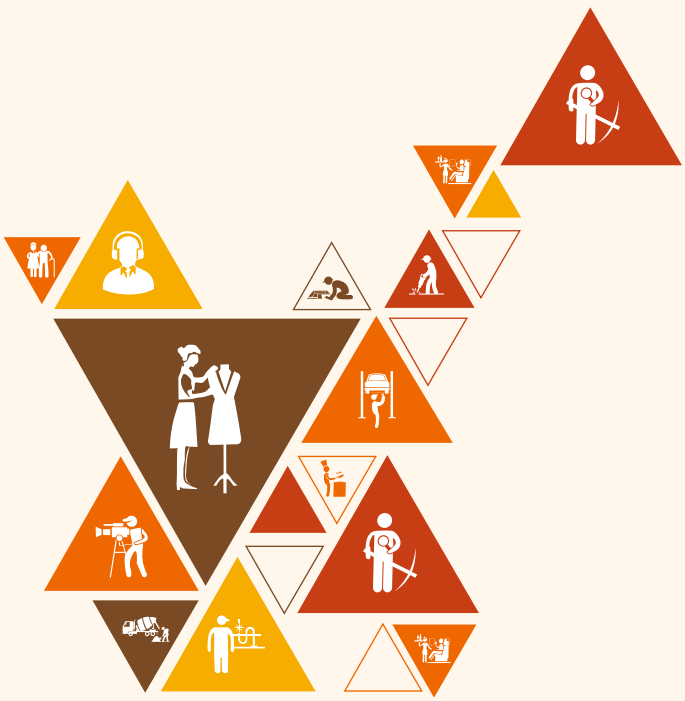
6. Programming and Algorithms

Unit 6.1 - Software Programming & Algorithm Development



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Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Implement appropriate standards to assist in performing software construction as per specifications
2. Identify software development needs and changes

Unit 6.1: Software Programming & Algorithm Development

Unit Objectives

At the end of this module, the participant will be able to:

1. List the steps involved in solving computational problems
2. List the disadvantages of data flow diagrams
3. Identify the process of algorithm development for software programming

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Welcome and greet the students.
- Begin the session with a brief recapitulation of the previous session.

Say

- " In our previous sessions, we covered topics such as of IT sector/subsectors and roles and responsibilities of a software developer."
- Today, let's start our session with appropriate standards for software construction."

Explain

- Explain the standards or fundamentals for software construction with the help of figure given in PH (Fig 6.1.1).
- Explain the different types of computational problems with the help of figure given in PH (Fig 6.1.3).
- Explain the problem developments step with the help of figure given in PH (Fig 6.1.4).
- Explain the purpose of software development in business with the help of figure given in PH (Fig 6.1.5).

- Explain the important steps in developing software using the figure given in PH (Fig 6.1.6)
- Explain the data flow diagrams.

Elaborate

- Elaborate the topics below:
  - Types and components of data flow diagram (Fig 6.1.8)
  - Important concepts associated with designing data flow diagrams
  - Steps in developing a data flow diagram (Fig 6.1.9)
  - Levels of data flow diagram (Fig 6.1.11)
  - Advantage and Limitation of data flow diagram (Fig 6.1.12)

Demonstrate

- Demonstrate the different types of flow chart with help of presentation and audio-video aids.

Ask

- What are the components of a data flow chart?
- What are the steps to make a data flow chart?

Notes for Facilitation

- Note down the responses on the Whiteboard given by the students.

Say

- "Earlier we have discussed about data flow diagram. Now we learn about algorithm development for software programming."

Explain

- Explain the algorithm development for software programming
- Explain conceptual design of algorithm.
- Explain steps for problem Development with the help of figure given in PH (Fig 6.1.14).

Demonstrate

- Demonstrate Programming and Algorithm for Software Development with the help of the AV link below:

  https://www.youtube.com/watch?v=7zPzu5TyYOg

Elaborate

- Elaborate the topics below:
  - Characteristics of algorithms (Fig 6.1.15)
  - Translation problems of algorithm (Fig 6.1.16)

Activity

Objective	The purpose of this activity is to understand how to create algorithm
Materials required	Pen and paper
Steps / procedure	• Ask the participants to take the help of presentation and Participant Handbook to develop the algorithm. • Ask the participants to make an algorithm on functionality of search engine. • Make the algorithm as specific as possible. • Give 5-10 minutes to complete the activity.
Conclusion / what has been achieved	This activity will help them to learn the process of developing algorithm.

Ask

- What is the algorithm?
- What are the steps to make an algorithm?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 6.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 6.1.4
  2. Reference given in 6.1.4
  3. Reference given in 6.1.5
  4. Reference given in 6.1.4

  Answer to Question 5:

  i. Functional primitive
  ii. Object models
  iii. Arrow

- Answer to Question 6:
  a. algorithm
  b. data flow diagram
  c. translating technical documents or a sworn statement

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www.youtube.com/watch?v=7zPzu5TyYOg

Unit 6.1 Software Programming & Algorithm Development

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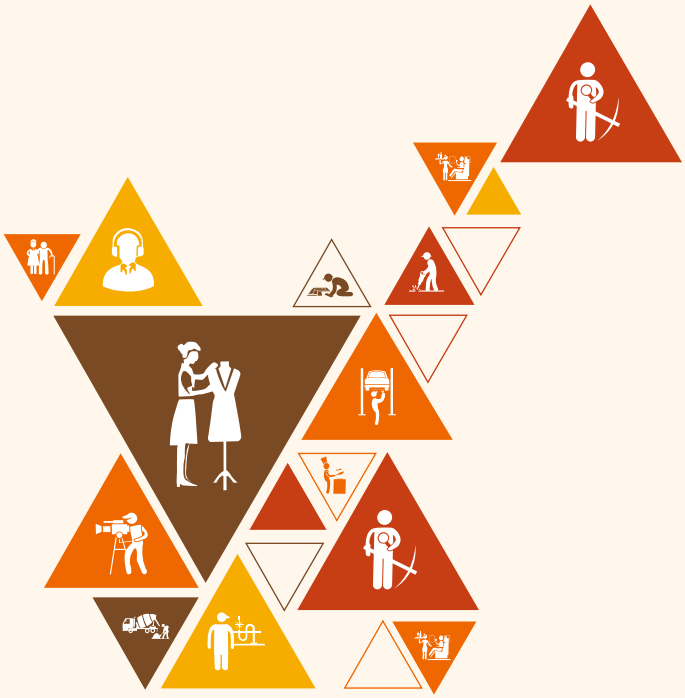
7. Design Software Applications

Unit 7.1 - Software Development Life Cycle

Unit 7.2 - Elements of Software Development Process



SSC/N0502

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Evaluate the various software testing methodology and identify the correct one to deploy
2. Analyze software designs for already built products or services

Unit 7.1: Software Development Life Cycle

Unit Objectives

At the end of this module, the participant will be able to:

1. Define the Software Development Life Cycle encompassing Business Requirements Specification (BRS), Software Requirements Specification (SRS), High-Level Design (HLD), and Low-Level Design (LLD)

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Welcome and greet the students.
- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous modules, we have discussed about the data flow chart and algorithm. "
- "In today's session, we will understand the software development life cycle."
- "The Software Development Lifecycle (SDLC) is a framework for defining the steps involved in software development. It describes the detailed plan for developing, deploying, and maintaining software. The SDLC defines the entire development cycle, which includes all tasks involved in gathering requirements for product maintenance. The goal of SDLC is to deliver a high-quality product that meets the needs of the customer."
- "Let's discuss in detail."

Explain

- Explain the Software Development Lifecycle (SDLC) using the figure given in Participant Handbook (Fig 7.1.1).
- Explain Business Requirements Specification (BRS) and its features using the figure given in Participant Handbook (Fig 7.1.2).
- Explain business requirements process using the figure given in Participant Handbook (Fig 7.1.4).
- Explain Software Requirement Specification (SRS) and its features using the figure given in Participant Handbook (Fig 7.1.5).
- Explain the steps involved in Software Requirement Specification (SRS) with the help of the figure given in Participant Handbook (Fig 7.1.6).

Elaborate

- Elaborate on the following topics:
  - High level design with the help of the figure given in Participant Handbook (Fig 7.1.8).
  - Low level design the figure given in Participant Handbook (Fig 7.1.10).
  - Different techniques used for requirements analysis

Ask

- What do you understand by Software Development Life Cycle (SDLC)?
- What are the business requirements in software development lifecycle?

Notes for Facilitation

- Note down the responses on the Whiteboard given by the students.

Elaborate

- Elaborate different techniques used for Requirements Analysis-
  - Business process modeling notation (BPMN) using the figure given in Participant Handbook (Fig 7.1.12)
  - UML (Unified Modeling Language) using the figure given in Participant Handbook (Fig 7.1.13)
  - Flowchart technique using the figure given in Participant Handbook (Fig 7.1.14)
  - Data flow diagram using the figure given in Participant Handbook (Fig 7.1.15)
  - Role Activity Diagrams (RAD) using the figure given in Participant Handbook (Fig 7.1.16)
  - Gantt Charts using the figure given in Participant Handbook (Fig 7.1.17)
  - IDEF (Integrated Definition for Function Modeling) using the figure given in Participant Handbook (Fig 7.1.18)
  - Gap Analysis using the figure given in Participant Handbook (Fig 7.1.19 and Fig 7.1.20)

Ask

- What is the used of UML (Unified Modeling Language) for the requirements analysis.
- What do you know about gap analysis process?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 7.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 7.1.6 and 7.1.7
  2. Reference given in 7.1.5
  3. Reference given in 7.1.3

  Answer to Question 7:

  a. Gap analysis
  b. Integrated definition for function modelling (IDEFM)
  c. linear, cross-functional, and top-down

  Answer to Question 5:

  i. Preliminary Investigation and Analysis
  ii. All of the above
  iii. Diagonal Prototype

Unit 7.2: Elements for Measuring Software Development Process

Unit Objectives

At the end of this module, the participant will be able to:

1. Classify elements for measuring various aspects of the software development process

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- "We have discussed the software development life cycle in previous session. Let's understand elements for measuring various aspects of the software development process in today's session."
- "The set of instructions in the form of programs that govern the computer system and process the hardware components is referred to as software."

Explain

- Explain the software development process.
- Explain the components of software development process and key process activities with the help of figure given in the participant handbook (fig 7.2.1)
- Explain the software crisis in the software development process using the figure given in the participant handbook (fig 7.2.3)
- Explain the software measurement metrix.

Demonstrate

- Demonstrate “Elements of Software Development Process” with the help of the AV link below: https://www.youtube.com/watch?v=05Pk0jFCvNk

Elaborate

- Elaborate the classification of software measurement metrix used in software dev with the help of flowchart given in the participant handbook (fig 7.2.4).

Ask

- What is product metrics?
- What do you understand by operating procedure in software development process?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 7.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in
  2. Reference given in 7.2.1
  3. Reference given in

  Answer to Question 4:

  a. Designing, programming, documenting, testing, and bug fixing
  b. Software development
  c. Software validation

  Answer to multiple choice question:

  1. Program
  2. Software evolution

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Unit 7.2 Elements of Software Development Process

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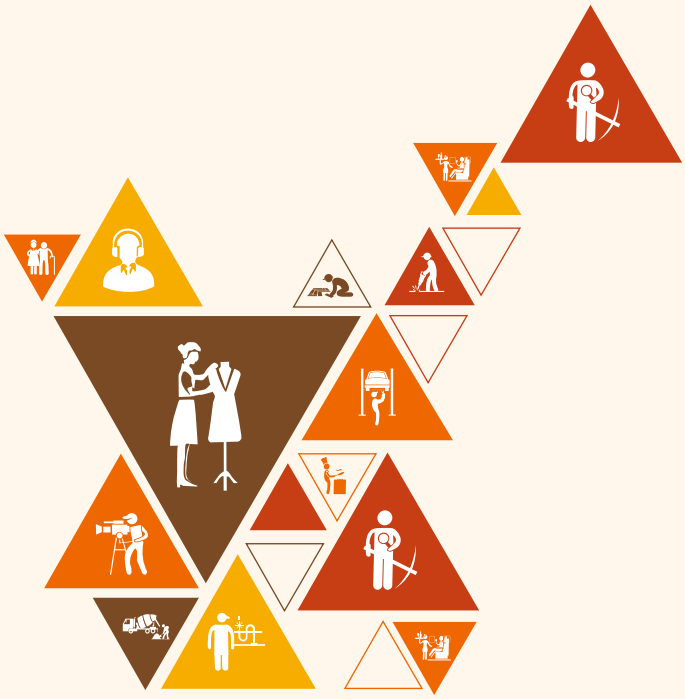
8. Work Requirements, Tools, and Software

Unit 8.1 - Program Specification and Programming Language

Unit 8.2 - Approaches to Develop Applications and the Key Processes



SSC/N0502

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Build database skills including DBMS and data design for the redevelopment process
2. Demonstrate application of source coding standards, ticketing tools, and other IT-related technologies

Unit 8.1: Program Specification and Programming Language

Unit Objectives

At the end of this module, the participant will be able to:

1. Discuss methods to read a detailed program specification and implement it using a programming language

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- ” In last module, we discussed about Software Development Life Cycle.”
- “We also covered Business Requirements Specification (BRS), Software Requirements Specification (SRS), High-Level Design (HLD), and Low-Level Design (LLD) in detail.”
- “So, can anyone explain SDLC in brief?”
- “Today, we will discuss about detailed program specification and implement it using a programming language”.

Explain

- Explain the program specification.
- Explain the reason why project prototype is important to everyone involved in the project with help of figure given in Participant Handbook (Fig 8.1.1).
- Explain seven ways to write better project specifications with help of figure given in Participant Handbook (Fig 8.1.2)
- Explain Programming Language.
- Explain the steps to create a programming language with help of figure given in Participant Handbook (Fig 8.1.3).

Elaborate

- Elaborate steps to create a Programming Language.

Ask

- What is the importance of involving whole team in a project?
- What do you understand by complier?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 8.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 8.1.3
  2. Reference given in 8.1.3
  3. Reference given in 8.1.1

Answer to Question 4:

a. formal language

b. program specification

Answer to Question 8:

Reference given in 8.1.2

Answer to Question 6:

1. Indicate how the site should function and know if something goes wrong
2. Compiler

Unit 8.2: Approaches to Develop Applications and the Key Processes

Unit Objectives

At the end of this module, the participant will be able to:

1. Discuss the various software engineering approaches to develop applications and the key processes

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Say

- "In previous session, we have learned about detailed program specification and programming language. Today we will start the session with main techniques used for software analysis and design."

Explain

- Explain the main techniques used for software analysis and design.
- Explain the software development approaches with the help of figure given in the Participant Handbook (Fig 8.2.1).
- Explain the different applications of software engineering with the help of figure given in the Participant Handbook (Fig 8.2.2).
- Explain the DBMS and its characteristics with the help of figure given in the Participant Handbook (Fig 8.2.3).

Demonstrate

- Demonstrate Database Management System with the help of the AV link below:
  https://www.youtube.com/watch?v=tN48NHI1eoQ

Elaborate

- Elaborate the application which are used DBMS-
  - Railway Reservation System
  - Library Management System
  - Banking
  - Universities and colleges
  - Credit card transactions
  - Social Media Sites
  - Telecommunication
  - Finance
  - Military
  - Online Shopping
  - Human Resource Management
  - Manufacturing
  - Airline Reservation system

Say

- "We have learned about DBMS and their uses. Now, we will learn how to develop a software."

Elaborate

- Elaborate the steps used for developing a software with the help of figure given in the Participant Handbook (Fig 5.2.19).

Ask

- What do you know about DBMS?
- Why DBMS is important in the manufacturing companies?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session with the detailed program specification and programming language.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Unit 5.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:

  Answer to Question I:

  1. Reference given in 5.2.4
  2. Reference given in 5.2.6
  3. Reference given in 5.2.5
  4. Reference given in 5.2.4

  Answer to Question 5:

  a. Education and entertainment software
  b. DBMS
  c. Quantity, bills, purchase, and supply chain management
  d. Secured and safe
  e. Business software

Answer to Question 6:

1. Reservation Software
2. Iterative

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Unit 8.2 Approaches to Develop Applications and the Key Processes

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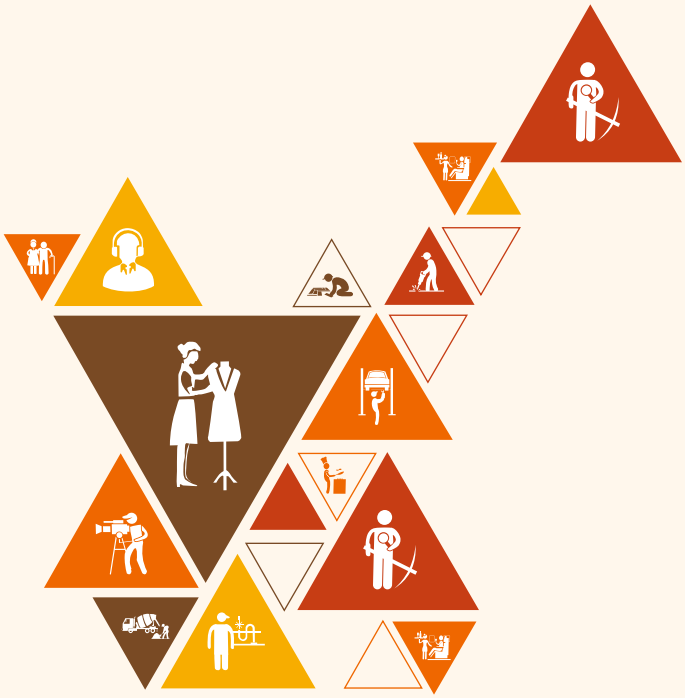
9. Implement & Improve the Gender Sensitivity, PWD (Person/People with Disability) Sensitivity and Greening

Unit 9.1 - Sustainable Practices

Unit 9.2 - Respect Diversity and Strengthen Practices to Promote Equality



SSC/N9014

Key Learning Outcomes

At the end of this module, the participant will be able to:

1. Illustrate sustainable practices in the workplace for energy efficiency and waste management
2. Apply different approaches to maintain gender equality and increase inclusiveness for PwD

Unit 9.1: Sustainable Practices

Unit Objectives

At the end of this unit, the participant will be able to:

1. Describe different approaches for efficient energy resource utilization and waste management
2. Describe the importance of following diversity policies

Resources to be Used

- Participant Handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous module, we gain an understanding on workplace data management."
- "We will now discuss the sustainable practices in workplace that optimize usage of material and energy. Moreover, waste management is a significant aspect of every organization. We will also discuss proper waste management and recycling processes here."

Ask

- Why do you think promoting greenery is important?
- How should an organization manage its waste products?

Notes for Facilitation

- Write down the participants' answers on whiteboard.
- Take appropriate cues from the answers and start teaching the lesson.

Say

- "Plants in workplaces purify the air; they reduce the concentration of CO2 (Carbon dioxide gas) and other volatile organic compounds, keeping the air fresh and healthy."
- "External vegetation moderates heat in and around office block in the summertime, pulling down heat stress and decreasing the necessity for air-conditioning".
- "Green roofs and facades proliferate insulation or the absorption capacity of heat, plummeting heating and cooling expenses".
- "Green environments encourage people to undertake activities such as a lunchtime walk, keeping staff alert and healthy. Long periods of sitting adversely affect health."
- "Renewable Energy is an eternal energy source that does not get depleted on exploitation and fetch nil or minimal waste product".
- "Let us now participate in an activity to understand the concept better."

Activity

Objective	The purpose of this activity is to prepare a sample checklist and monitor energy usage.
Materials required	Pen, Paper
Steps/procedure	• This activity is in the form of "Prepare a sample checklist and monitor energy usage". • This activity targets to make the trainees understand the optimization of energy in the workplace. • The trainer will divide the class into three groups. • The trainer will distinguish one particular room for the case study. • Each group will be assigned with the following tasks. • Count the number of lights, fans and ACs in the case study room. • Note down the duration of their usage. • Assess the proper usage and wastage. • Prepare a checklist to evaluate how to optimize the energy usage. • Submit a document furnishing observations. • The trainer will check the documents and declare the best group.
Conclusion / what has been achieved	This activity helps the participants to understand the optimization of energy in the workplace.

Explain

- Explain how to optimize the usage of electricity/energy, materials and water.
- Explain the significance of greening.
- Explain the initiative towards efficient use of natural resources and energy, reduction and prevention of pollution with help of Table 9.1.1 given in the Participant Handbook.
- Explain various energy options including renewable and non-renewable.

Do/Demonstrate

- Demonstrate 'Sustainable Practices' with the help of the AV link - https://www.youtube.com/watch?v=-6DDfGT-aUQ

Elaborate

- Elaborate the following topics:
  - Electricity first aid emergency procedures
  - Steps to free a person from electrocution
  - Segregate Recyclable, Non-Recyclable and Hazardous Waste
  - Process of reporting potential hazard
  - Hazard Identification
  - Hazard and Operability (HAZOP) Study
  - 3Rs of waste optimization

Activity

Objective	The purpose of this activity is to prepare a sample hazard measurement checklist.
Materials required	Pen, Paper
Steps/procedure	• This activity is in the form of "Waste management". • The trainer will ask every trainee to prepare a sample hazard measurement checklist. • The trainees should assess the waste management system of the building. • They should prepare a document on the existing waste management system and propose systems to enhance it. • They must be able to segregate between different types of waste and their treatment. • On the merit of the document submitted by the trainees, the trainer will announce the best reports. • The trainees who furnished best reports will be appreciated by the class.
Conclusion / what has been achieved	This activity helps the participants to recognize potential hazards at workplace.

Summarize

- Summarize the session using roleplay on the techniques of telecalling.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Unit 9.2: Respect Diversity and Strengthen Practices to Promote Equality

Unit Objectives

At the end of this unit, the participant will be able to:

1. Identify stereotypes and prejudices associated with people with disabilities and the negative consequences of prejudice and stereotypes
2. Discuss the importance of promoting, sharing, and implementing gender equality and PwD sensitivity guidelines at the organizational level

Notes for Facilitation

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous unit, we discussed the sustainable practices in workplace that optimize usage of material and energy. Moreover, waste management is a significant aspect of every organization."
- "We also discussed proper waste management and recycling processes."
- "Today we will talk about gender sensitivity at workplace and PWD related policies to strengthen and promote equality."

Ask

- Why do you think promoting gender equality at workplace is important?

Notes for Facilitation

- Write down the participants' answers on whiteboard.
- Take appropriate cues from the answers and start teaching the lesson.

Say

- "The Constitution of India applies uniformly to equality of opportunity for all citizens (including every legal citizen of India, whether they are the disabled) in matters relating to employment or healthy or disabled."
- "The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 prescribes a system for investigating and redressing complaints against sexual harassment of women at the workplace."
- "The definition of a 'disabled person' is broadened under the 2016 Act: it covers persons with disability, persons with benchmark disability, and persons with disability having high support needs
- The Indian Government respects the equality and therefore no discrimination should be made on the ground of disability."
- "The definition of a 'disabled person' is broadened under the 2016 Act: it covers persons with disability, persons with benchmark disability, and persons with disability having high support needs."
- "Let us now participate in an activity to understand the concept better."

Activity

Objective	The purpose of this activity is to learn the laws and regulations related to PWD issued by the government.
Materials required	N/A
Steps/procedure	• This activity is in the form of "elocution session." • The Trainer will divide the class into 4 groups. • Each group will be assigned with one law related to PWD compliance issued by the government of India (as discussed in the unit). • The groups will come in front of the class one by one and explain the key features and advantages of the law assigned to them. • The Trainer will supervise the session. • The best group will be appreciated by the class.
Conclusion / what has been achieved	This activity helps the participants to understand the laws and regulations related to PWD compliance issued by the government of India

Explain

- Explain the concept of Gender, Gender Equality and Gender discrimination.
- Explain the policies and procedures about gender inclusivity, equality and sustainability while working with colleagues.
- Explain the organization's Redressal Mechanisms.

Elaborate

- Elaborate the following topic - Comply to PWD Inclusive Policies.

Activity

Objective	The purpose of this activity is to learn the importance of gender equality at workplace.
Materials required	Pen, Paper
Steps/procedure	• This activity is in the form of 'written test" • Each Trainee will be provided with blank sheets and pen • The Trainer will read out the following question to the Trainees • What is gender equality and workplace and how that can be implemented and strengthened? • The Trainees will get 15 minutes to answer the above question • They should write the answer in the stipulated time • The Trainer will check the answers Trainees with best answers will be appreciated by the class.
Conclusion / what has been achieved	This activity helps the participants to implement gender equality at workplace.

Summarize

- Summarize the session using roleplay on the techniques of telecalling.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Module 9.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act - 2013
    2. The Person with Disabilities Act - 1995
    3. The Mental Health Act - 1987
    4. The Rehabilitation Council of India - 1992
    5. The National Trust Act - 1999
  - Answers to Questions II
    1. 1. (b)
    2. 2. (c)
    3. 3. (a)
  - Answers to Questions III
    1. Identifying hazards, assessing the risks, controlling and mitigating risks
    2. Wind energy, solar energy, geothermal energy, bio energy, hydropower energy
    3. In order to ensure speedy justice, special courts are instituted in each district to deal with cases pertaining to the violation of the rights of disabled persons. Penalties for the violation of rights of disabled persons can extend to a monetary fine of US$7,750 (Rs 500,000) and imprisonment for up to five years.
    4. Switch off the main power, don't touch the person who is electrocuted, try to remove the person from the electrical source with the help of non-conducting objects like stick, cardboard, bamboo, etc. , lay the person in this position.

QR Code

Scan the QR Code to watch the related video

youtu.be/-6DDfGT-aUQ

Unit 9.1 Sustainable Practices

Skill India
कौशल भारत-कुशल भारत

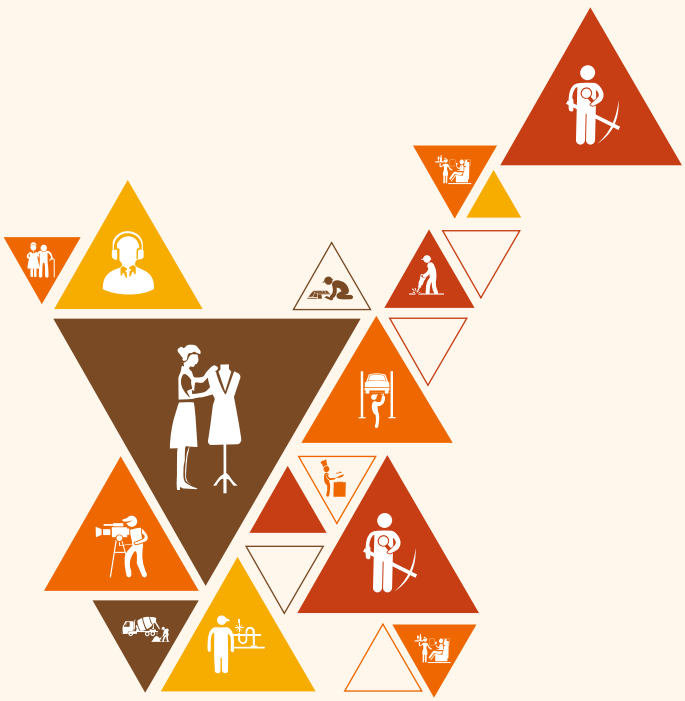
सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

IT - ITeS SSC
NASSCOM

10. Employability and Entreprenuership Skills

https://eskillindia.org/NewEmployability



Employability skills can be defined as those soft skills which employers look for in a potential employee. These skills equip the employees to carry out their role to the best of their ability and client satisfaction. For example, the ability to explain what you mean in a clear and concise way through written and spoken means helps to build a better relationship with the client or the customer. Similarly, handling stress that comes with deadlines for finishing work and ensuring that you meet the deadlines can be done through effective self-management training. It can also be done by working well with other people from different disciplines, backgrounds, and expertise to accomplish a task or goal. In today's digital age, employers expect that the employees should be able to make use of elementary functions of information and communication technology to retrieve, access, store, and produce, present and exchange information in collaborative networks via the Internet. Students need to develop entrepreneurial skills, so that they can develop necessary knowledge and skills to start their own business, thus becoming job creators rather than job seekers. Potential employees need to develop green skills, which are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community. Thus, students are expected to acquire a range of skills so that you can meet the skill demands of the organisation that you would work for or to set up and run your own business.

This chapter is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

The scope covers the following:

- Introduction to Employability Skills
- Constitutional values – Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs.

Scan the QR codes or click on the link to watch the related videos

youtu.be/SVPlPwNekWc

Work ethics to follow in an organization

youtu.be/8fLC8f_CGZY

Significance of Healthy Team Bonding in Ideal Work Culture

youtu.be/MMTsl2xT2_8

Evacuation procedures for workers and visitors

youtu.be/p6IP9IPeVhM

Health, Safety,and Accident Reportng Procedures and the Importance

youtu.be/a8NETGQQhyI

Follow the accurate process flow to analyze data

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

IT - ITeS SSC
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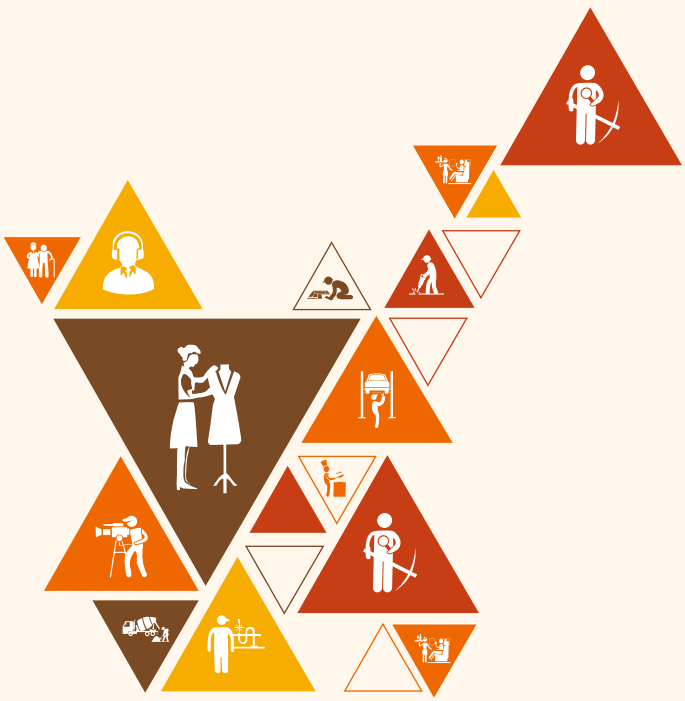
11. Annexures

Annexure I : Annexure QR Code

Annexure II : Training Delivery Plan

Annexure III: Assessment Criteria



ANNEXURE I - QR Codes

S.no.	Chapter No.	Unit No.	Topic Name	Page No.	QR code(s)	URL
1.	Chapter 3 Process of Software Development	Unit 3.1 Software Development Lifecycle	Software Development Lifecycle	19		youtu.be/9ir7wv2xNDI
2.	Chapter 4 Process of Application Development	UNIT 4.2 Custom and Rapid Application Software	Structured Design Analysis and Custom & Rapid Application Development	32		youtu.be/fvKMBzefA_E
3.	Chapter 5 Concept of Re-usable Code Development	Unit 5.1 Software Testing	Software Testing and Validations	39		youtu.be/zBWLkwTqJYs
4.	Chapter 6 Programming and Algorithm for Software Development	Unit 6.1 Software Programming & Algorithm Development	Software Programming & Algorithm Development	46		youtu.be/7zPzu5TyYOg
5.	Chapter 7 Design of Software Applications	Unit 7.2 Elements of Software Development Process	Elements of Software Development Process	55		youtu.be/05Pk0jFCvNk
6.	Chapter 8 Work requirement and Tools for the Job Role	Unit 8.2 Approaches to Develop Applications and the Key Processes	Database Management System	64		youtu.be/tN48NHI1eoQ
7.	Chapter 9 Inclusive and Environmentally Sustainable Workplaces	Unit 9.1 - Sustainable Practices	Sustainable Practices	74		youtu.be/-6DDfGT-aUQ

ANNEXURE I - QR Codes

S.no.	Chapter No.	Unit No.	Topic Name	Page No.	QR code(s)	URL
8.	Employability Skills (DGT/VSQ/N0102)	Employability and Entreprenuership Skills	Work ethics to follow in an organization	77		youtu.be/SVPlPwNekWc
9.	Employability Skills (DGT/VSQ/N0102)	Employability and Entreprenuership Skills	Significance of Healthy Team Bonding in Ideal Work Culture			youtu.be/8fLC8f_CGZY
10.	Employability Skills (DGT/VSQ/N0102)	Employability and Entreprenuership Skills	Evacuation Procedures for Workers and Visitors			youtu.be/MMTsl2xT2_8
11.	Employability Skills (DGT/VSQ/N0102)	Employability and Entreprenuership Skills	Health, Safety, and Accident Reporting Procedures and the Importance			youtu.be/p6IP9IPeVhM
12.	Employability Skills (DGT/VSQ/N0102)	Employability and Entreprenuership Skills	Follow the Accurate Process Flow to Analyse Data			youtu.be/a8NETGQQhyI

Annexure II
Training Development Plan

Training Delivery Plan			
Program Name	**Software Developer Product Development**		
Qualification Pack, Name and Reference ID	Software Developer Product Development SSC/Q6702, v3.0		
Version No.	3.0	**Version Update Date**	27/01/2022
Minimum Educational Qualification and Experience	Graduation in relevant field (Statistics/ Science/Technology/ Mathematics) OR 12th Class (Maths Stream) with 3 years of relevant experience in IT Job Roles		
Pre-requisites to Training (If any)	Software Development Certifications in C++, Embedded, C#, C, Java, etc.		
Minimum Job Entry Age	20 Years		
Training Outcome	**After completing this programme, trainee will be able to:** • Analyse users' needs to design, test, and develop software as per requirement. • Evaluate various steps to design models and approaches to facilitate software development process. • Use proper application of scripting language to automate tasks and write simple programs. • Analyse the use of a decision table based on number of conditions that may affect a decision. • Discuss about manual and automated testing process. • Examine the conversion process of specifications into code to meet the requirements. • Implement appropriate standards to assist in performing software construction as per specifications. • Identify software development needs and changes. • Analyse software designs for already built products or services. • Build data base skills including DBMS, data design for predevelopment process. • Demonstrate application of source coding standards, ticketing tools and other IT related technologies. • Demonstrate effective communication and collaboration with colleagues.		

	• Apply measures to maintain standards of health and safety at the workplace. • Use different approaches to effectively manage and share data and information • Develop strong relationships at the workplace through effective communication and conflict management. • Identify best practices to maintain an inclusive, environmentally sustainable workplace.

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
1.	Process of Software Development (SSC/N0502)	Software Development Lifecycle	1. List the phases of the software development lifecycle	SSC/N 0502	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Software Development Lifecycle (Contd….)					T: 0 P: 8
		Software Development Lifecycle (Contd….)	2. Discuss the differences between top-down and bottom-up design approaches		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Software Development Lifecycle (Contd….)					T: 4 P: 2
		Software Development Lifecycle (Contd….)					T: 2 P: 2
2.	Process of Application Management (SSC/N0502)	Quality Attributes of Software Requirements Specification	1. Identify different techniques used for requirements analysis	SSC/N0 502	Interactive Lecture in the Class, Activity, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 0

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Quality Attributes of Software Requirements Specification (Contd…)					T: 2 P: 6
		Quality Attributes of Software Requirements Specification (Contd…)					T: 0 P: 4
		Quality Attributes of Software Requirements Specification (Contd…)					T: 0 P: 4
		Custom and Rapid Application Software	2. Discuss the primary differences between custom application development and rapid application development.		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 8 P: 0
		Custom and Rapid Application Software (Contd…)					T: 2 P: 6
		Custom and Rapid Application Software (Contd…)					T: 0 P: 4

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
3.	Concept of Re-usable Code Development (SSC/N0502)	Software Testing	1. Identify the validation and verification components covered under software testing	SSC/N 0502	Interactive Lecture in the Class, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 6 P: 2
		Software Testing (Contd…)	1. Identify the validation and verification components covered under software testing		Interactive Lecture in the Class, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Software Testing (Contd…)	1. Identify the validation and verification components covered under software testing 2. List the components of a test plan		Interactive Lecture in the Class, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Software Testing (Contd…)	2. List the components of a test plan		Interactive Lecture in the Class, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 6 P: 2
		Software Testing (Contd…)					T: 0 P: 8
		Software Testing (Contd…)					T: 0 P: 5

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
4.	Programming and Algorithm for Software Development (SSC/N0502)	Software Programming & Algorithm Development	1. List the steps involved in solving computational problems	SSC/N0502	Interactive Lecture in the Class, Activity, Demonstrate	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Software Programming & Algorithm Development (Contd….)	1. List the steps involved in solving computational problems 2. List the disadvantages of data flow diagrams		Interactive Lecture in the Class, Activity, Demonstrate		T: 4 P: 4
		Software Programming & Algorithm Development (Contd….)	2. List the disadvantages of data flow diagrams 3. Identify the process of algorithm development for software programming		Interactive Lecture in the Class, Activity, Demonstrate		T: 3 P: 5
		Software Programming & Algorithm Development (Contd….)	2. List the disadvantages of data flow diagrams 3. Identify the process of algorithm development for software programming		Interactive Lecture in the Class, Activity, Demonstrate		T: 4 P: 4
		Software Programming & Algorithm Development (Contd….)	3. Identify the process of algorithm development for software programming		Interactive Lecture in the Class, Activity, Demonstrate		T: 0 P: 8

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Software Programming & Algorithm Development (Contd….)					T: 0 P: 6
5.	Design of Software Applications (SSC/N0502)	Software Development Life Cycle	1. Define the Software Development Life Cycle encompassing Business Requirements Specification (BRS), Software Requirements Specification (SRS), High-Level Design (HLD), and Low-Level Design (LLD)	SSC/N 0502	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 7 P: 1
		Software Development Life Cycle (Contd….)	1. Define the Software Development Life Cycle encompassing Business Requirements Specification (BRS), Software Requirements Specification (SRS), High-Level Design (HLD), and Low-Level Design (LLD)		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Software Development Life Cycle (Contd....)	1. Define the Software Development Life Cycle encompassing Business Requirements Specification (BRS), Software Requirements Specification (SRS), High-Level Design (HLD), and Low-Level Design (LLD)		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 6
		Elements for Measuring Software Development Process	2. Classify elements for measuring various aspects of the software development process		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 8 P: 0
		Elements for Measuring Software Development Process (Contd....)	2. Classify elements for measuring various aspects of the software development process		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Elements for Measuring Software Development Process (Contd....)	2. Classify elements for measuring various aspects of the software development process		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 7

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
6.	Work Requirements, Tools, and Software for the Job Role (SSC/N0502)	Program Specification and Programming Language	1. Discuss methods to read a detailed program specification and implement it using a programming language	SSC/N0502	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 6 P: 2
		Program Specification and Programming Language (Contd….)					T: 0 P: 8
		Approaches to Develop Applications and the Key Processes	1. Identify various software engineering approaches to develop applications and the key processes		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Approaches to Develop Applications and the Key Processes (Contd….)					T: 0 P: 6

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
7.	Inclusive and environmentally sustainable workplaces (SSC/N 9014)	Sustainable Practices	1. Describe different approaches for efficient energy resource utilization and waste management.	SSC/N 9014	Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 5
		Sustainable Practices (Contd…)	2. Describe the importance of following the diversity policies		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 5
		Sustainable Practices (Contd…)	3. Identify stereotypes and prejudices associated with people with disabilities and the negative consequences of prejudice and stereotypes.		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Respect Diversity and Strengthen Practices to Promote Equality	4. Discuss the importance of promoting, sharing and implementing gender equality and PwD sensitivity guidelines at organization level.		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
8.	Employability & Entrepreneurship Skills	Introduction to Employability Skills	1. Discuss the Employability Skills required for jobs in various industries 2. List different learning and employability related GOI and private portals and their usage	N/A	Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P:1
		Constitutional Values: Citizenship	1. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen 2. Show how to practice different environmentally sustainable practices		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P:1
		Becoming a Professional in the 21st Century	1. Discuss importance of relevant 21st century skills.		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P:1.5

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
			1. Exhibit 21st century skills like Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. 2. Describe the benefits of continuous learning				
		Basic English Skills	1. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone 2. Read and interpret text written in basic English 3. Write a short note/paragraph / letter/e -mail using basic English		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Basic English Skills (Contd.)					T: 0 P: 2

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Communication Skills	1. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. 2. Explain the importance of active listening for effective communication 3. Discuss the significance of working collaboratively with others in a team		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P:3
		Essential Digital Skills	1. Describe the role of digital technology in today's life 2. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely 3. Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely and securely 4. Create sample word documents, excel sheets and presentations using basic features utilize virtual collaboration tools to work effectively		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P:2
		Essential Digital Skills (Contd.)					T: 0 P:4

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Diversity and Inclusion	1. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD 2. Discuss the significance of escalating sexual harassment issues as per POSH		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P:1.5
		Financial and Legal Literacy	1. Outline the importance of selecting the right financial institution, product, and service 2. Demonstrate how to carry out offline and online financial transactions, safely and securely		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P:3
		Career Development and Goal-Setting	1. Create a career development plan with well-defined short- and long-term goals		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P:1
		Customer Service	1. Describe the significance of analysing different types and needs of customers 2. Explain the significance of identifying customer needs and responding to them in a professional manner. 3. Discuss the significance of maintaining hygiene and dressing appropriately		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P:3

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Getting Ready for Apprentic eships and Jobs	1. Create a professional Curriculum Vitae (CV) 2. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively 3. Discuss the significance of maintaining hygiene and confidence during an interview 4. Perform a mock interview 5. List the steps for searching and registering for apprenticeship opportunities		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P:5
						Total (In Hours)	**Theory** 120
							Practical 210
							On the Job Training 90
							***Grand Total (in Hours)** 420 hours

Annexure III

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for Technical Support	
Job Role	**Software Developer Product Development**
Qualification Pack	**SSC/Q6702, v3.0**
Sector Skill Council	**IT-ITeS Sector Skills Council NASSCOM**

Sr. No.	Guidelines for Assessment
1.	Criteria for assessment for each Qualifications File will be approved by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2.	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3.	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/ option NOS/ Set of NOS.
4.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.
6.	To pass the Qualifications File, every trainee should score a minimum of 70 % of aggregate marks.
7.	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification File.

Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
1. SSC/N0502: Develop software code to specification		100	100	20	80
	PC1. check the understanding of Business Requirements Specification (BRS), Software Requirements Specification (SRS), High Level Design (HLD) and Low-Level Design (LLD) with subject matter experts		5	5	-
	PC2. access reusable components, code generation tools and unit testing tools from the organization's knowledge base		10	-	10
	PC3. convert technical specifications into code to meet the requirements, leveraging reusable components, where available		10	-	10
	PC4. create appropriate unit test cases (UTCs)		10	-	10
	PC5. review codes and UTCs with experts and execute the same		15	5	10
	PC6. rework the code and UTCs to fix identified defects		10	-	10
	PC7. analyze inputs from managers to inform future designs		5	5	-

Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
	PC8. record corrective actions for identified defects to inform future designs		10	-	10
	PC9. submit tested code for approval by experts		5	5	-
	PC10. update the organization's knowledge base with your experiences of the code developed		10	-	10
	PC11. comply with the organization's policies, procedures and guidelines when developing software code to specification		10	-	10
		Total	100	20	80
SSC/N9004: Workplace data management		Total	100	25	75
	PC1. establish and agree with appropriate people the data/information you need to be provided, the formats in which you need to provide it, and when it needs to be provided	100	12.5	12.5	-
	PC2. obtain the data/information from reliable sources		12.5	-	12.5
	PC3. check that the data/ information is accurate, complete, and up to date		12.5	6.25	6.25

Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
	PC4. obtain advice or guidance from appropriate people where there are problems with the data/information		12.5	-	12.5
	PC5. carry out rule-based analysis of the data/information, if required		25	-	25
	PC6. insert the data/information into the agreed formats		12.5	-	12.5
	PC7. report any unresolved anomalies in the data/ information to appropriate people		6.25	6.25	-
	PC8. provide complete, accurate and up-to- date data/information to the appropriate people in the required formats on time		6.25	-	6.25
			100	25	75

Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
6. SSC/N9014: Maintain an inclusive, environmentally sustainable workplace		Total	100	20	80
	PC1. optimize usage of electricity/energy, materials, and water in various tasks/ activities / processes and plan the implementation of energy efficient systems in a phased manner	100	20	5	15
	PC2. segregate recyclable, non-recyclable and hazardous waste generated for disposal or efficient waste management		20	5	15
	PC3. understand the diversity policy of the organization and use internal & external communication to colleagues to improve		15	5	10
	PC4. comply with PwD inclusive policies for an adaptable and equitable work environment		10	-	10
	PC5. improve through specifically designed recruitment practices, PwD friendly infrastructure, job roles, etc.		20	-	20

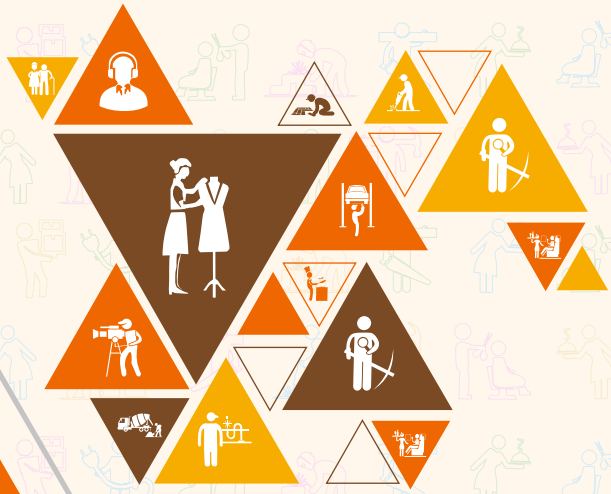
Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
	PC6. use and advocate for appropriate verbal/nonverbal communication, schemes and benefits of PwD		15	5	10
		Total	100	20	80
Employability NOS for 60 Hours	PC1. Introduction to Employability Skills	50	2	1	1
	PC2. Constitutional values – Citizenship		2	1	1
	PC3. Becoming a Professional in the 21st Century		6	2	4
	PC4. Basic English Skills		6	2	3
	PC5. Career Development & Goal Setting		3	1	2
	PC6. Communication Skills		4	2	2
	PC7. Diversity & Inclusion		2	1	2
	PC8. Financial and Legal Literacy		5	2	3

Total Marks: 350	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Total Marks (350)**	**Theory Marks**	**Practical Marks**	**Viva Marks**
Assessable Outcomes	**Assessment Criteria for the Outcomes**	**Total Mark**	**Out of**	**Theory**	**Skills Practical**
	PC9. Essential Digital Skills		8	3	4
	PC10. Entrepreneurship		4	2	3
	PC11. Customer Service		3	1	2
	PC12. Getting Ready for Apprenticeship & Jobs		5	2	3
	Total		50	20	30

Glossary

- **Sector:** Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
- **Sub-sector:** Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
- **Occupation:** Occupation is a set of job roles, which perform similar/ related set of functions in an industry. Job role: Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
- **Occupational Standards (OS):** OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
- **Performance Criteria (PC):** Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
- **National Occupational Standards (NOS):** NOS are occupational standards which apply uniquely in the Indian context.
- **Qualifications Pack (QP):** QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
- **Unit Code:** Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
- **Unit Title:** Unit title gives a clear overall statement about what the incumbent should be able to do.
- **Description:** Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
- **Scope:** Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
- **Knowledge and Understanding (KU):** Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
- **Organisational Context:** Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
- **Technical Knowledge:** Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
- **Core Skills/ Generic Skills (GS):** Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
- **Electives:** Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.

- **Options:** Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.



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