



# Model Curriculum

QP Name: CNC Programmer

QP Code: CSC/Q0401

Version: 3.0

NSQF Level: 5

Model Curriculum Version: 3.0

Capital Goods Skill Council || Awfis Space Solutions Pvt. Ltd, 1st Floor, L-29, Outer Circle, ConnaughtPlace,  
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# Table of Contents

Training Parameters.....	3
Program Overview .....	4
Training Outcomes.....	4
Compulsory Modules.....	4
Module 1: Introduction to the role of a CNC Programmer.....	7
Module 2: Health and safety Practices .....	8
Module 3: Process of Coordinating with co-workers to achieve work efficiency.....	11
Module 4: Process of programming Computer Numerically Controlled (CNC) machines.....	13
Module 5: Process of Assist in process improvements and machine maintenance.....	16
Module 6: Introduction to Employability Skills.....	18
Module 7: Constitutional values - Citizenship.....	19
Module 8: Becoming a Professional in the 21st Century.....	20
Module 9: Basic English Skills.....	21
Module 10: Career Development & Goal Setting.....	22
Module 11: Communication Skills.....	23
Module 12: Diversity & Inclusion.....	24
Module 13: Financial and Legal Literacy.....	25
Module 14: Essential Digital Skills.....	26
Module 15: Entrepreneurship.....	27
Module 16: Customer Service.....	28
Module 17: Getting ready for apprenticeship & Jobs.....	29
Annexure.....	30
Trainer Requirements .....	30
Assessor Requirements.....	31
Assessment Strategy .....	32
References .....	34
Glossary.....	34
Acronyms and Abbreviations.....	35

## Training Parameters

<b>Sector</b>	Capital Goods
<b>Sub-Sector</b>	Machine Tools, Dies, Moulds and Press Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
<b>Occupation</b>	Design
<b>Country</b>	India
<b>NSQF Level</b>	5
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/ NIL
<b>Minimum Educational Qualification and Experience</b>	10th Class Pass with 4 years relevant experience OR 12th pass with 1 year (NTC or NAC or NITC) OR 12th Grade pass with 2 years relevant experience OR Certified in NSQF-L4 Materials - Engineer with 3 years relevant experience OR Completed 3 years diploma (mechanical) after 10th with 1 year relevant experience OR Completed 1st year of 2 year of diploma (after 12th) OR Completed 1st year of UG (UG Certificate) OR Pursuing 2nd year of UG
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	31/03/2022
<b>Next Review Date</b>	31/03/2025
<b>NSQC Approval Date</b>	31/03/2022
<b>QP Version</b>	3.0
<b>Model Curriculum Creation Date</b>	31/03/2022
<b>Model Curriculum Valid Up to Date</b>	31/03/2025

<b>Model Curriculum Version</b>	3.0
<b>Minimum Duration of the Course</b>	540 Hours
<b>Maximum Duration of the Course</b>	540 Hours

## Program Overview

This section summarizes the end objectives of the program along with its duration.

### Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Explain the importance of following the health and safety practices at work.
- Demonstrate ways to coordinate with co-workers to achieve work efficiency.
- Demonstrate the process of programming Computer Numerically Controlled (CNC) machines.
- Describe the process of assisting in process improvements and machine maintenance.

### Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>CSC/N1335 Follow the health and safety practices at work</b> NOS Version- 2.0 NSQF Level- 3	25:00	35:00	0:00	00:00	60:00
Module 1: Introduction to the role of a CNC Programmer	05:00	0:00	0:00	00:00	06:00
Module 2: Health and safety practices	20:00	35:00	0:00	00:00	55:00
<b>CSC/N1336 Coordinate with co-workers to achieve work efficiency</b> NOS Version-2.0 NSQF Level- 3	10:00	20:00	0:00	00:00	30:00
Module 3: Process of coordinating with co-workers to achieve work efficiency	10:00	20:00	0:00	00:00	30:00
<b>CSC/N0401 Program Computer Numerically Controlled (CNC) machines</b> NOS Version- 2.0 NSQF Level- 5	70:00	125:00	45:00	00:00	195:00
Module 4: Process of programming Computer Numerically Controlled (CNC) machines	70:00	125:00	45:00	00:00	195:00

<b>CSC/N0415 Assist in process improvements and machine maintenance NOS Version- 1.0 NSQF Level- 5</b>	<b>45:00</b>	<b>90:00</b>	<b>15:00</b>	<b>00:00</b>	<b>150:00</b>
Module 5: Process of Assist in process improvements and machine maintenance	45:00	90:00	15:00	00:00	135:00
<b>DGT/VSQ/N0102 - Employability Skills (60 hours) NOS Version No. – 1.0 NSQF Level – 4</b>	<b>24:00</b>	<b>36:00</b>	<b>00:00</b>	<b>00:00</b>	<b>60:00</b>
Module 6: Introduction to Employability Skills	0.5:00	1:00	00:00	00:00	1.5:00
Module 7: Constitutional values - Citizenship	0.5:00	1:00	00:00	00:00	1.5:00
Module 8: Becoming a Professional in the 21st Century	1:00	1.5:00	00:00	00:00	2.5:00
Module 9: Basic English Skills	4:00	6:00	00:00	00:00	10:00
Module 10: Career Development & Goal Setting	1:00	1:00	00:00	00:00	2:00
Module 11: Communication Skills	2:00	3:00	00:00	00:00	5:00
Module 12: Diversity & Inclusion	1:00	1.5:00	00:00	00:00	2.5:00
Module 13: Financial and Legal Literacy	2:00	3:00	00:00	00:00	5:00
Module 14: Essential Digital Skills	4:00	6:00	00:00	00:00	10:00
Module 15: Entrepreneurship	3:00	4:00	00:00	00:00	7:00
Module 16: Customer Service	2:00	3:00	00:00	00:00	5:00
Module 17: Getting ready for apprenticeship & Jobs	3:00	5:00	00:00	00:00	8:00
<b>Total Duration</b>	<b>174:00</b>	<b>306:00</b>	<b>60:00</b>	<b>00:00</b>	<b>540:00</b>

# Module Details

## Module 1: Introduction to the role of a CNC Programmer

*Mapped to CSC/N1335 v2.0*

### Terminal Outcomes:

- Discuss the job role of a CNC Programmer.

<b>Duration: 05:00</b>	<b>Duration: 0:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the size and scope of the capital good industry and its sub-sectors.</li> <li>• Discuss the role and responsibilities of a CNC Programmer.</li> <li>• Identify various employment opportunities for a CNC Programmer.</li> </ul>	
<b>Classroom Aids</b>	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
<b>Tools, Equipment and Other Requirements</b>	
NA	

## Module 2: Health and safety Practices

### Mapped to CSC/N1335 v2.0

#### Terminal Outcomes:

- Demonstrate ways to maintain personal health and safety.
- Describe the process of assisting in hazard management.
- Explain how to check the first aid box, firefighting and safety equipment.
- Describe the process of assisting in waste management.
- Explain the importance of following the fire safety guidelines.
- Explain the importance of following the emergency and first-aid procedures.
- Demonstrate the process of carrying out relevant documentation and review.

Duration: 20:00	Duration: 35:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask.</li> <li>• Explain the importance and process of checking the work conditions, assessing the potential health and safety risks, and take appropriate measures to mitigate them.</li> <li>• Explain the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions.</li> <li>• Explain the recommended techniques to be followed while lifting and moving heavy objects to avoid injury.</li> <li>• Explain the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment.</li> <li>• Explain the importance and process of identifying existing and potential hazards at work.</li> <li>• Describe the process of assessing the potential risks and injuries associated with the various hazards.</li> <li>• Explain how to prevent or minimise different types of hazards.</li> <li>• Explain how to handle and store hazardous materials safely.</li> <li>• Explain the importance of ensuring the first aid box is updated with the relevant first aid supplies.</li> <li>• Describe the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the use of appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions.</li> <li>• Demonstrate how to handle hazardous materials safely.</li> <li>• Demonstrate the process of testing the firefighting and various safety equipment to ensure they are in usable condition.</li> <li>• Demonstrate the process of recycling and disposing different types of waste appropriately.</li> <li>• Demonstrate how to use the appropriate type of fire extinguisher to extinguish different types of fires safely.</li> <li>• Demonstrate how to administer appropriate first aid to the injured personnel.</li> <li>• Demonstrate the process of performing Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest.</li> <li>• Demonstrate the process of carrying out appropriate documentation following a health and safety incident at work, including all the required information.</li> </ul>



- Explain the criteria for segregating waste into appropriate categories.
- Describe the appropriate methods for recycling recyclable waste.
- Describe the process of disposing of the non-recyclable waste safely and the applicable regulations.
- Explain the use of different types of fire extinguishers to extinguish different types of fires.
- State the recommended practices to be followed for a safe rescue during a fire emergency.
- Explain how to request assistance from the fire department to extinguish a serious fire.
- Explain the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property.
- State the common health and safety hazards present in a work environment, associated risks, and how to mitigate them.
- State the safe working practices to be followed while working at various hazardous sites and using electrical equipment.
- Explain the importance of ensuring easy access to firefighting and safety equipment.
- Explain the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases.
- Explain various causes of fire in different work environments and the recommended precautions to be taken to prevent fire accidents.
- Describe different methods of extinguishing fire.
- List different materials used for extinguishing fire.
- Explain the applicable rescue techniques to be followed during a fire emergency.
- Explain the importance of placing safety signs and instructions at strategic locations in a workplace and following them.
- Explain different types of first aid treatment to be provided for different types of injuries.
- State the potential injuries associated with incorrect manual handling.

<ul style="list-style-type: none"> <li>• Explain how to move an injured person safely.</li> <li>• State various hazards associated with the use of various machinery, tools, implements, equipment and materials.</li> <li>• Explain the importance of ensuring no obstruction and free access to fire exits.</li> <li>• Explain how to free a person from electrocution safely.</li> <li>• Explain how to administer appropriate first aid to an injured person.</li> <li>• Explain how to perform Cardiopulmonary Resuscitation (CPR).</li> <li>• Explain the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation.</li> <li>• State the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included.</li> <li>• Explain the importance and process of reviewing the health and safety conditions at work regularly or following an incident.</li> <li>• Explain the importance and process of implementing appropriate changes to improve the health and safety conditions at work.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator’s Guide, Participant’s Handbook.</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Personal Protective Equipment, Cleaning Equipment and Materials, Sanitizer, Soap, Mask</p>	

## Module 3: Process of coordinating with co-workers to achieve work efficiency

*Mapped to NOS CSC/N1336 v2.0*

### Terminal Outcomes:

- Demonstrate ways to Work and communicate effectively with co-workers.
- Discuss ways to promote diversity and inclusion at the workplace.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain the importance and process of effective communication in the workplace.</li> <li>• Explain the barriers to effective communication and how to overcome them.</li> <li>• Explain the importance of teamwork in an organisation’s and individual’s success.</li> <li>• Explain the importance of active listening in the work environment.</li> <li>• State the appropriate techniques to be followed for active listening.</li> <li>• Explain the importance of tone and pitch ineffective communication.</li> <li>• Explain the importance of avoiding casual expletives and unpleasant terms while communicating professional circles.</li> <li>• Explain the importance of maintaining discipline and ethical behaviour at work.</li> <li>• State the common reasons for interpersonal conflict and how to resolve them.</li> <li>• Explain the importance of developing effective working relationships for professional success.</li> <li>• Describe the process of expressing and addressing grievances appropriately and effectively.</li> <li>• Explain the importance and process of planning daily tasks to ensure their timely completion and efficient use of time.</li> <li>• Explain the importance of adhering to the limits of authority at work.</li> <li>• Explain the importance of following the applicable quality standards and timescales at work.</li> <li>• Explain the importance of coordinating with co-workers to achieve the work objectives efficiently.</li> <li>• Explain the relevant documentation</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the process of preparing the relevant documents and reports as per the supervisor’s instructions, providing appropriate information clearly and systematically.</li> <li>• Demonstrate how to mentor and assist subordinates in the execution of their work responsibilities.</li> <li>• Demonstrate the process of using various resources efficiently to ensure maximum utilisation and minimum wastage.</li> <li>• Demonstrate how to communicate clearly and politely to ensure effective communication with co-workers.</li> <li>• Demonstrate appropriate verbal and non-verbal communication that is respectful of genders and disability.</li> </ul>

<p>requirements.</p> <ul style="list-style-type: none"> <li>• Explain the importance of providing appropriate information clearly and systematically in work documents.</li> <li>• State the escalation matrix to be followed to deal with out of authority tasks and concerns.</li> <li>• Explain the importance and process of mentoring and assisting subordinates in execution of their work responsibilities.</li> <li>• Explain how to identify possible disruptions to work prevent them.</li> <li>• Explain how to use various resources efficiently to ensure maximum utilisation and minimum wastage.</li> <li>• Explain the recommended practices to be followed at work to avoid and resolve conflicts at work.</li> <li>• Explain the importance and process of efficient and timely dissemination of information to the authorised personnel.</li> <li>• Explain the procedure to report inappropriate behaviour e.g., harassment.</li> </ul>	
<p><b>Classroom Aids:</b></p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>NA</p>	

## Module 4: Process of programming Computer Numerically Controlled (CNC) machines

*Mapped to CSC/N0401 v2.0*

### Terminal Outcomes:

- Describe the process of preparing for programming the CNC machine for production.
- Demonstrate the process of carrying out programming for CNC machine.
- Demonstrate the process of testing and proving the program on the CNC machine.
- Demonstrate various practices for effective resource optimisation.

<b>Duration: 70:00</b>	<b>Duration: 125:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the applicable specific safe working practices to be followed.</li> <li>• Describe the CNC programming procedures and environmental regulations that must be observed.</li> <li>• Explain the use of the appropriate reference manuals and programming codes to suit the machine controller.</li> <li>• Explain the importance of using the correct and updated version of the program.</li> <li>• Explain the importance of entering the tool and work offsets correctly.</li> <li>• Explain how to ensure that the program does not result in tool collision with the workpiece or work holding devices.</li> <li>• Explain the importance of clamping the workpiece and tools firmly.</li> <li>• Explain the importance of using the correct control program and ensuring it is correctly loaded into the machine controller.</li> <li>• State the hazards associated with carrying out the machining operations on a CNC machine and how to minimize them.</li> <li>• List the appropriate PPE to be used during machining operations.</li> <li>• State the safety mechanism on various machines and how to check if they are functioning correctly.</li> </ul> <p>Explain common terminology used in CNC programming.</p> <ul style="list-style-type: none"> <li>• Explain various features of CNC programs.</li> <li>• Explain the criteria for selecting the CNC strategies based on material, fixturing, holding and clamping force.</li> <li>• Explain the factors to be considered while selecting tungsten carbide for use, such as hardness of the component material; machinability characteristics of the material; tolerances to be achieved; etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the use of reference charts, engineering drawings, tables and graphs to get relevant information such as tapping sizes and threads, cutting parameters, feeds, speed, depth of cut, machining tolerances, etc.</li> <li>• Demonstrate the process of conducting the preliminary checks to determine the readiness of the program so that the CNC machine operates correctly.</li> <li>• Show how to create the CNC program with commands for tool motions, spindle motions, miscellaneous functions and tool change, in syntax corresponding to the machine and control system on which the component will be machined.</li> <li>• Show how to use subprograms and canned cycles to reduce program size and input time, and prevent memory overflow on the machine.</li> <li>• Demonstrate how to transfer the program to the machine by entering it in the console or transmitting it through a wired link or a data transfer device.</li> <li>• Demonstrate the process of carrying out relevant documentation as per the organisational policy.</li> <li>• Demonstrate how to measure tool and work offset data i.e. X and Z offsets for lathes; and work offsets, length offsets and tool radius for machining centres.</li> <li>• Show how to enter work offset and tool data on the machine X and Z offsets, tool orientation and nose radius for lathes; length offsets and tool radius for machining centres.</li> <li>• Show how to edit the program and adjust tool and wear offsets to correct any dimensional errors on the part.</li> </ul>

- Explain the importance of selecting tools based on material, finish required and tolerances achieved.
- Explain the importance of cutter engagement and exit.
- Explain the relevant factors affecting the tool life.
- Explain the importance and effect of the depth of cut, Revolutions Per Minute (RPM) and feed.
- Explain how to read and interpret first and third angle component drawings.
- Explain how to extract information from engineering drawings or data and related specifications.
- Explain how to use the function keys and user interface of the machine control system.
- Explain how to determine the entry of work, tool offsets, tool wear data.
- Explain the features and working parts of the CNC machine, and the appropriate accessories used with it.
- Explain the importance of following specified machining sequences and procedures.
- Explain the importance of ensuring the suitability of workpieces/materials and consumables for the specified job and related procedures.  
Explain the importance and process to be followed to ensure that tools and equipment are in a safe and usable condition.
- Explain how to perform various CNC operations, and the use of relevant equipment.
- Describe the method of setting the workholding devices.
- Explain the use of various tool holding devices.
- Describe the method of correctly mounting and securing the cutting tools to the tool holders.
- Explain how to set the machine controller in the program and editing mode, and enter or download the prepared program.
- Explain the use of automatic tool changers, pallet changers, rotary tables and part autoloaders.
- Explain how to position and identify the tools in relation to the operating program.
- State the relevant error messages and the appropriate actions to be taken to deal

- Demonstrate the process of replace the worn-out tools and indexable inserts, whenever required.
- Demonstrate how to prepare and verify all technical documents for CNC programs.
- Demonstrate the process of performing the appropriate quality assurance tests to ensure the final product meets the design specifications.
- Demonstrate various practices to optimise the usage of various resources such as water and electricity.

with them.

- Explain the importance and process of proving the program.
- Explain the importance of selecting the correct proving tools.
- Explain the importance and process of storing programs on appropriate storage devices safely and correctly, and protecting them from contaminants and electromagnetic sources.
- Describe the applicable quality control procedures and the use of relevant equipment.
- Explain the importance of identifying and resolving problems promptly.
- Explain the importance of writing programs that are easily editable or correctable by the next person.  
Describe the appropriate methods for the checking quality of shaped components against the required quality standards.
- Explain how to determine the production cost, machine hour rate, raw material cost, tool cost, coolant cost, overheads, cycle time, idle time, cost of machine idling, part rejection cost.
- Explain the criteria for selecting cutting tools, tool materials, chip breaker geometry, cutting parameters from tool catalogues, and coolant.
- Explain the relationship between surface finish, tool nose radius and feed rate.
- State the impact of depth of cut on chatter, surface finish.
- List various materials used in common engineering applications.
- Explain how to identify various materials by their physical properties.
- Explain the benefits of resource optimisation.

**Classroom Aids**

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

**Tools, Equipment and Other Requirements**

(2-Axis CNC Machine, 3-Axis Machining Centers (VMC, HMC), > 3 Axes Machining Centers (3.5/4/5 Axes) , Measuring Tools , Hand Tools , Power Tools , PPE , Drawing Tools , GD&T , Etc.

## Module 5: Process of Assist in process improvements and machine maintenance

*Mapped to CSC/N0415 v1.0*

### Terminal Outcomes:

- Describe the process of assisting in process improvements and machine maintenance.

<b>Duration: 45:00</b>	<b>Duration: 90:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Explain the importance of coordinating with engineering and supervisory personnel to troubleshoot and resolve design, equipment and operating difficulties.</li> <li>Explain how to ensure optimal use of materials in various applications.</li> <li>Explain the importance and process of checking all designs to find appropriate solutions to reduce manufacturing cost and time.</li> <li>Describe the process of monitoring the CNC programs to ensure accuracy of all instructions through comparison with original blueprints.</li> <li>Describe the process of designing new programs for all production machines to ensure quality.</li> <li>Describe the process of designing a program network to increase the efficiency of all programs.</li> <li>Describe the process of developing new processes to reduce the time for CNC programs and resolve any issues encountered with them.</li> <li>Explain the importance and process of training all operators in the use of new CNC programs and equipment.</li> <li>Explain the importance of checking machines periodically to ensure appropriate calibration and identifying maintenance needs.</li> <li>Explain the importance of replacing the worn-out and damaged parts with manufacturer-recommended authentic parts. Explain the importance of carrying out regular and preventative maintenance as per the relevant maintenance checklists.</li> <li>Explain the importance of following the manufacturer's instructions for carrying out various maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to design new programs for all production machines to ensure quality.</li> <li>Demonstrate how to design program network to increase the efficiency of all programs.</li> <li>Demonstrate the process of performing basic troubleshooting when a machine malfunctions.</li> <li>Demonstrate the process of carrying out various maintenance activities such as cleaning and sharpening.</li> </ul>



<b>Classroom Aids</b>
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop
<b>Tools, Equipment and Other Requirements</b>
NA

## Module 6: Introduction to Employability Skills

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements

<b>Duration:</b> <0.5:00>	<b>Duration:</b> <1:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss the importance of Employability Skills in meeting the job requirements</li> </ul>	<ul style="list-style-type: none"> <li>• List different learning and employability related GOI and private portals and their usage</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 7: Constitutional values - Citizenship

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Discuss about constitutional values to be followed to become a responsible citizen

<b>Duration: &lt;0.5:00&gt;</b>	<b>Duration: &lt;1:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to practice different environmentally sustainable practices</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 8: Becoming a Professional in the 21st Century

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Demonstrate professional skills required in 21<sup>st</sup> century

<b>Duration: &lt;1:00&gt;</b>	<b>Duration: &lt;1.5:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss 21st century skills.</li> <li>• Describe the benefits of continuous learning</li> </ul>	<ul style="list-style-type: none"> <li>• Exhibit 21st century skills like Self-Awareness, Behavior 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.</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 9: Basic English Skills

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Practice basic English speaking.

<b>Duration: &lt;4:00&gt;</b>	<b>Duration: &lt;6:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe basic communication skills</li> <li>• Discuss ways to read and interpret text written in basic English</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone</li> <li>• Read and interpret text written in basic English</li> <li>• Write a short note/paragraph / letter/e - mail using basic English</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 10: Career Development & Goal Setting

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Demonstrate Career Development & Goal Setting skills.

<b>Duration: &lt;1:00&gt;</b>	<b>Duration: &lt;1:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss need of career development plan</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to communicate in a well -mannered way with others.</li> <li>• Create a career development plan with well-defined short- and long-term goals</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 11: Communication Skills

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Practice basic communication skills.

<b>Duration: &lt;2:00&gt;</b>	<b>Duration: &lt;3:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the importance of active listening for effective communication</li> <li>• Discuss the significance of working collaboratively with others in a team</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 12: Diversity & Inclusion

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Describe PwD and gender sensitisation.

<b>Duration:</b> <1:00>	<b>Duration:</b> <1.5:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss the significance of reporting sexual harassment issues in time</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	



## Module 13: Financial and Legal Literacy

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Describe ways of managing expenses, income, and savings.

<b>Duration: &lt;2:00&gt;</b>	<b>Duration: &lt;3:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• List the common components of salary and compute income, expenditure, taxes, investments etc.</li> <li>• Discuss the legal rights, laws, and aids</li> </ul>	<ul style="list-style-type: none"> <li>• Outline the importance of selecting the right financial institution, product, and service</li> <li>• Demonstrate how to carry out offline and online financial transactions, safely and securely</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 14: Essential Digital Skills

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Demonstrate procedure of operating digital devices and associated applications safely.

<b>Duration: &lt;4:00&gt;</b>	<b>Duration: &lt;6:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the role of digital technology in today's life</li> <li>• Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to operate digital devices and use the associated applications and features, safely and securely</li> <li>• Create sample word documents, excel sheets and presentations using basic features</li> <li>• Utilize virtual collaboration tools to work effectively</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 15: Entrepreneurship

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Describe opportunities as an entrepreneur.

<b>Duration: &lt;3:00&gt;</b>	<b>Duration: &lt;4:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the types of entrepreneurship and enterprises</li> <li>• Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan</li> <li>• Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement</li> </ul>	<ul style="list-style-type: none"> <li>• Create a sample business plan, for the selected business opportunity</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 16: Customer Service

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Describe ways of maintaining customer.

<b>Duration: &lt;2:00&gt;</b>	<b>Duration: &lt;3:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the significance of identifying customer needs and addressing them.</li> <li>• Explain the significance of identifying customer needs and responding to them in a professional manner.</li> <li>• Discuss the significance of maintaining hygiene and dressing appropriately.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to maintain hygiene and dressing appropriately.</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 17: Getting ready for apprenticeship & Jobs

### Mapped to DGT/VSQ/N0102

#### Terminal Outcomes:

- Describe ways of preparing for apprenticeship & Jobs appropriately.

<b>Duration: &lt;3:00&gt;</b>	<b>Duration: &lt;5:00&gt;</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Discuss the significance of maintaining hygiene and confidence during an interview</li> <li>List the steps for searching and registering for apprenticeship opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Create a professional Curriculum Vitae (CV)</li> <li>Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively</li> <li>Perform a mock interview</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

# Annexure

## Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma /Degree	Diploma /Degree in Mechanical Engineering	4	CNC Programmer	0		Practical skills and knowledge required in the relevant field
Certified in relevant CITS course as appropriate						

Trainer Certification	
Domain Certification	Platform Certification
<p><b>“CNC Programmer, CSC/Q0401, v3.0”.</b> The minimum accepted score is 80%</p>	<p><b>“Trainer, MEP/Q2601”</b> Minimum accepted score is 80%.</p>

## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma /Degree	Diploma /Degree in Mechanical Engineering	4	CNC Programmer	0		Practical skills and knowledge required in the relevant field
Certified in relevant CITS course as appropriate						

Assessor Certification	
Domain Certification	Platform Certification
“CNC Programmer, CSC/Q0401, v3.0”. The minimum accepted score is 80%	“Assessor, MEP/Q2701” Minimum accepted score is 80%.

## Assessment Strategy

### 1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- The assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

### 2. Testing Environment

To ensure a conducive environment for conducting a test, the trainer will:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be 10 a.m. and 5 p.m. respectively
- Ensure there are 2 Assessors if the batch size is more than 30.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

### 3. Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that levels 1 to 3 are for the unskilled & semi-skilled individuals, and levels 4 and above are for the skilled, supervisor & higher management
- The assessor must be ToA certified and the trainer must be ToT Certified
- The assessment agency must follow the assessment guidelines to conduct the assessment

### 4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme-specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

### 5. Method of verification or validation:

To verify the details submitted by the training centre, the assessor will undertake:

- A surprise visit to the assessment location
- A random audit of the batch
- A random audit of any candidate

### 6. Method for assessment documentation, archiving, and access

To protect the assessment papers and information, the assessor will ensure:

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded/accessed from Cloud Storage



- Soft copies of the documents & photographs of the assessment are stored on the Hard drive

# References

## Glossary

Term	Description
<b>Declarative knowledge</b>	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
<b>Key Learning</b>	The key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on-site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on-site
<b>Procedural Knowledge</b>	Procedural knowledge addresses how to do something, or how to perform a
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training.</b>
<b>Terminal Outcome</b>	The terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module.</b> A set of terminal outcomes help to achieve the training outcome.

## Acronyms and Abbreviations

Term	Description
NOS	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
OJT	On-the-Job Training
OMR	Optical Mark Recognition
PC	Performance Criteria
PwD	Persons with Disabilities
QP	Qualification Pack
SDMS	Skill Development & Management System
SIP	Skill India Portal
SSC	Sector Skill Council
TC	Trainer Certificate
ToA	Training of Assessors
ToT	Training of Trainers
TP	Training Provider