





Model Curriculum

NOS Name: CNC Lathe Programming

NOS Code:

NOS Version: 1.0

Model Curriculum Version: 1.0





State Council for Technical Education & Vocational Training Unit-8, Near Raj Bhawan, Bhubaneswar, Odisha - 751012

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Training Parameters

Sector	Manufacturing
Sub-Sector	Manufacturing
Occupation	Machine Programming
Country	India
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification and Experience	12th grade pass Or Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma Or 10th grade pass plus 2-year NTC Or 8th pass plus 2-year NTC plus 1-Year NAC plus CITS Or 10th grade pass and pursuing continuous schooling Or 10th Grade Pass with 2 years of relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	15 years
Last Reviewed On	
Next Review Date	
NSQC Approval Date	
NOS Version	1.0
Model Curriculum Creation Date	
Model Curriculum Valid Up to Date	
Model Curriculum Version	1.0
Minimum Duration of the Course	120 Hours 00 Minutes
Maximum Duration of the Course	120 Hours 00 Minutes





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.

- Perform writing of program form CNC lathe machine operation as per the part development requirement
- Carry out testing and validation of machine program for proper functionality

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
SCTVET/N – CNC Lathe Programming NOS Version No. – 1.0	40:00	80:00			120:00
Module 1: Introduction to the CNC machine programming	01:00	0:00			01:00
Module 2: CNC lathe machine programming	39:00	80:00			119:00
Total Duration	40:00	80:00			120:00





Module Details

Module 1: Introduction to the CNC machine programming

Bridge module

Terminal Outcomes:

• Discuss about CNC machine programming.

Duration: <01:00>	Duration: <0:00>		
Theory – Key Learning	Practical – Key Learning		
 List various software used in industry for CNC machine programming. Discuss the CNC machine programming standards and procedures involved in industry. Elaborate product modelling standards and techniques followed in industry. 			
Classroom Aids:			
Whiteboard, marker pen, projector			
Tools, Equipment and Other Requirements			





Module 2: CNC lathe machine programming

Mapped to SCTVET/N, v1.0

Terminal Outcomes:

- Demonstrate how to write the program for CNC lathe machine operation.
- Show how to test and validate the written program.





bed added in the NC/CNC operation sheets.

- List tools and equipment for testing and proving the program.
- Explain procedure of testing and validating the program and rectifying the errors and faults in it.
- Elaborate reasons for testing and proving the NC/CNC program.
- Describe dimensions, surface finishes and geometrical parameters such as concentricity, parallelism, runout, etc.

program.

- Apply appropriate ways to check that the part program is efficient and results in minimal cycle time, with optimal cutting parameters and no unnecessary tool motions.
- Demonstrate how to select and apply advanced operations using canned cycles and sub-routines.
- Show how to transfer the program to the machine.
- Show how to use the part program in single block mode and check the condition of the tool after each operation.
- Show how to check the sequence of the program, annotation information, selection of the processing method, tool size information, machine parameters, tool compensation information etc. in the CNC lathe processing program as per the process sheet.
- Apply appropriate ways to check for overcutting, under-cutting or collision interference in the CNC machining program.
- Show how to check spindle and chuck runout and repeatability of all linear axis.
- Demonstrate organizational procedure of for calling up the program and dealing with any error messages or faults.
- Apply appropriate ways to store or save the program in storage medium.
- Demonstrate organizational procedure of preparing operation sheets to specification in accordance with SOPs.
- Apply appropriate ways to check that measuring equipment are calibrated and approved for use.
- Show how to pre-set the tooling appropriately using setting jigs/fixtures and mount tools in the correct positions in the tool turret.
- Demonstrate how to operate machine in manual mode to test and prove program and cut a trial part using single block run, dry run and feed, and speed override controls.
- Show how to edit program, resolve error messages and faults on the program.
- Show how to prepare and verify all





technical documents for CNC programs.

Classroom Aids:

Whiteboard, marker pen, projector

Tools, Equipment and Other Requirements

PCs in LAN network, Integrated multimedia software/Hardware for training in CNC programming, UPS, Printer, Simulator, Generator Set/Power Back UP, Industrial grade CNC Turning Center with cutting tools, Industrial grade CNC Vertical Machining center with cutting tools, Part drawing





Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational	Specialization	Relevant Industry Experience		Training Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
B.E/B.Tech	Mechanical	1	CNC machine programming	1	CNC machine programming	NA
Diploma	Mechanical	2	CNC machine programming	1	CNC machine programming	NA
Trainer Certification						
Domain Certification		Platform Certification				
"CNC Lathe Programming, SCTVET/N, version 1.0". Minimum accepted score is 80%.		"Trainer, MEP/Q2601 v2.0" Minimum accepted score is 80%.				





Assessor Requirements

Assessor Prerequisites						
Minimum Educational	nimum Specialization Relevant Indus ucational Experience		ant Industry ence	ustry Training Experience		Remarks
Qualification		Years	Specialization	Years	Specialization	
B.E/B.Tech	Mechanical	1	CNC machine programming	1	CNC machine programming	NA
Diploma	Mechanical	3	CNC machine programming	1	CNC machine programming	NA
Assessor Certification						
Domain Certification				Platform Certification		
"CNC Lathe Programming, SCTVET/N, version 1.0".			. "Assessor;	"Assessor; MEP/Q2701 v2.0"		
Minimum accepted score is 80%.			Minimum	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 Training agency





- Assessment agency deploys the ToA certified Assessor for executing the assessment
- Training agency monitors the assessment process & records
- 2. Testing Environment:
 - 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 as 10 a.m. and 5 p.m.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - 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 level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - 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:
 - Surprise visit to the assessment location
 - Random audit of the batch
 - Random audit of any candidate
- 6. Method for assessment documentation, archiving, and access
 - 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 in the Hard Drives





References

Glossary

Term	Description
Declarative Knowledge	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.
Key Learning Outcome	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).
(M) TLO	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.





Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualification Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
wi	Work Instructions
PPE	Personal Protective equipment