Competency Standard (CS)

CNC Machine Operation (Wood)

Level-3

Furniture Sector

Competency Standard Code: CS-FUR-CNCMO-L3-EN-V1

National Skills Development Authority
Chief Advisor's Office
Government of the People's Republic of Bangladesh

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This Competency Standard for **CNC Machine Operation (Wood)** is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with **Furniture Sector**, industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.

Introduction

The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**CNC Machine Operation (Wood)**" is selected as one of the priority occupations of **Furniture** Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (BNQF) under Bangladesh National Qualification Framework and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A **Competency Standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in **Furniture Sector**.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

Competency Standards for National Skill Certificate – 3 in CNC Machine Operation (Wood) in Furniture Sector

Level Descriptors of Skills Sector, BNQF Level 1-6

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyze, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation.
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

CS	-	Competency Standard
ISC	-	Industry Skills Council
FURISC	-	Furniture Industry Skills Councils
NSDA	-	National Skills Development Authority
BNQF	-	Bangladesh National Qualification Framework
OSH	-	Occupational Safety and Health
PPE	-	Personal Protective Equipment
SCVC	-	Standards and Curriculum Validation Committee
STP	-	Skills Training Provider
SOP	-	Standard Operating Procedure
UoC	-	Unit of Competency
CNCMO	-	CNC Machine Operation (Wood)
CAD and CAM	-	Computer Aided Design and Computer Aided Manufacturing
4 iR	-	4th Industrial Revolution

Approved by the Authority meeting, held on .....

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Competency Standards for National Skill Certificate – 3 in
CNC Machine Operation (Wood)
Course Structure

SL.	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				**30**
1.	GU-01-L1-V1	Perform Computations Using Basic Mathematical Concepts	1	15
2.	GU-02-L2-V1	Apply Occupational Health and Safety (OHS) Procedure in The Workplace	1	15
Sector Specific Units of Competencies				**40**
3.	SU-FUR-02-L1-V1	Use Measuring Instruments	1	20
4.	SU-FUR-03-L1-V1	Interpret Technical Drawing	1	20
Occupation Specific Units of Competencies				**240**
5.	OU-FUR-CNCMO-01-L3-V1	Use Hand Tools and Power Tools	3	20
6.	OU-FUR-CNCMO-02-L3-V1	Operate Single Head CNC Machine	3	120
7.	OU-FUR-CNCMO-03-L3-V1	Operate CNC Lathe Machine	3	100
		Total Nominal Hours		**310**

Units & Elements at a Glance:

Generic Units of Competencies (30 hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU-01-L1-V1	Perform Computations Using Basic Mathematical Concepts	1. Identify calculation requirements in the workplace 2. Select appropriate mathematical methods for the calculation. 1. Use tool/instrument to perform calculations	15
GU-02-L1-V1	Apply Occupational Health and Safety (OHS) Procedure in the Workplace	2. Identify OSH policies and procedures 3. Follow OSH procedure 4. Report hazards and risks 5. Respond to emergencies 6. Maintain personal well-being	15

Sector Specific Units of Competencies (40 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SU-FUR-02-L1-V1	Use Measuring Instrument	1. Select measuring instruments 2. Carry out measurements and calculation 3. Maintain measuring instruments	20
SU-FUR-03-L1-V1	Interpret Technical Drawings	1. Select technical drawing 2. Interpret drawing and sketches	20

Occupation Specific Units of Competencies (240 Hours)

Code	Unit of Competency	Elements of Competency	Hours
OU-FUR-CNCMO-01-L3-V1	Use Hand Tools and Power Tools	1. Prepare for works 2. Prepare hand tools and power tools 3. Apply hand tools and power tools 4. Maintain hand tools and power tools	20
OU- FUR-CNCMO-02-L3-V1	Operate Single Head CNC Machine	1. Prepare for CNC operation 2. Set- up machine, cutting tools and workpiece 3. Operate single head CNC 4. Check and measure workpiece 5. Maintain and clean workplace	120

OU- FUR-CNCMO-03-L3-V1	Operate CNC Lathe Machine	1. Prepare for CNC lathe operation 2. Set- up machine, and workpiece 3. Operate CNC Lathe 4. Maintain tools, equipment and workplace	100

Generic Units of Competencies

Unit Code and Title	**GU-01-L1-V1: Perform Computations Using Basic Mathematical Concepts**
Nominal Hours	**15 Hours**
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to perform computations using basic mathematical concepts in the workplace. It specifically includes the tasks of identifying calculation requirements in the workplace, selecting appropriate mathematical method/concept for the calculation and using appropriate instruments tools to perform calculation.
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables Training Components
1. Identify calculation requirements in the workplace	1.1 Job requirements are identified 1.2 **Measurements** are selected in accordance with job requirement 1.3 Calculation requirements are identified from **workplace information**
2. Select appropriate mathematical methods for the calculation.	2.1 Mathematical methods are identified 2.2 **Appropriate method** is selected to carry out the calculation re quirements 2.3 Tolerance and clearance limits are identified and adjusted according to the job requirements
3. Use tool/instrument to perform calculations	3.1 Work instructions are confirmed and applied to the job in hand 3.2 Materials to be measured are identified as per job specification 3.3 Appropriate **tool/ instrument** is selected based on materials to be measured
Range of Variables	
Variable	**Range** (may include but not limited to)
1. Measurements	1.1 Length 1.2 Width 1.3 Weight 1.4 Tolerance
2. workplace information	2.1 Job Order 2.2 Design 2.3 Working drawing 2.4 Verbal instructions 2.5 Written Instruction
3. Appropriate method	3.1 Addition 3.2 Subtraction 3.3 Division 3.4 Multiplication 3.5 Conversion

	3.6 Percentage and ratio calculation
4. Tool/ Instrument	4.1 Calculator 4.2 Scale 4.3 Measuring tape 4.4 Marker
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 identified calculation requirements from workplace information 1.2 selected appropriate method to carry out the calculation 1.3 requirements 1.4 selected measurements 1.5 selected appropriate methods 1.6 used tool/instrument 1.7 added numbers 1.8 subtracted numbers 1.9 multiplied numbers. 1.10 divided numbers. 1.11 completed calculations using appropriate tools/instruments
2. Underpinning Knowledge	2.1. Numerical concept 2.2. Basic mathematical methods such as addition, subtraction, multiplication and division and percentage. 2.3. Mathematical language, symbols and terminology. 2.4. Measuring units
3. Underpinning Skills	3.1 Interpret numerical concept 3.2 Interpret mathematical methods such as addition, subtraction , multiplication and division and percentage. 3.3 Interpret mathematical language, symbols and terminology. 3.4 Interpret measuring units
4. Underpinning Attitudes	4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace 4.6. Communication with peers and seniors in workplace
5. Resource Implications	5.1. Work place Procedure 5.2. Materials relevant to the proposed activity 5.3. All tools, equipment, material and documentation required. 5.4. Relevant specifications or work instructions
6. Methods of Assessment	6.1. Written Test 6.2. Demonstration

	6.3. Oral Questioning 6.4. Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated 7.3 assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	**GU-02-L1-V1: Apply Occupational Health and Safety (OHS) Procedure in the Workplace**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to apply occupational health and safety (OHS) procedure in the workplace. It specifically includes identifying OHS policies and procedures, following OHS procedure, reporting hazards and risks, responding to emergencies, and maintaining personal well-being.
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Identify OSH policies and procedures	1.1. **OHS policies** and **safe operating procedures** are accessed and stated 1.2. **Safety signs and symbols** are identified and followed 1.3. Emergency response, evacuation procedures and other contingency measures are determined according to workplace requirements
2. Follow OSH procedure	2.1 **Personal protective equipment (PPE)** is selected and collected as required 2.2 Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices 2.3 A clear and tidy workplace is maintained as per workplace standard 2.4 PPE is maintained to keep them operational and compliant with OHS regulations
3. Report hazards and risks.	3.1 **Hazards** and risks are identified, assessed and controlled 3.2 Incidents arising from hazards and risks are reported to designated authority
4. Respond to emergencies	4.1 Alarms and warning devices are responded 4.2 Workplace **emergency procedures** are followed 4.3 **Contingency measures** during workplace accidents, fire and other emergencies are recognized and followed in accordance with organization procedures 4.4 Frist aid procedures is applied during emergency situations
5. Maintain personal well-being	5.1 OHS policies and procedures are adhered to 5.2 OHS awareness programs are participated in as per workplace guidelines and procedures 5.3 Corrective actions are implemented to correct unsafe condition in the workplace 5.4 **"Fit to work" records** are updated and maintained according

	to workplace requirements
Range of Variables	
Variables	**Range** (may include but not limited to):
1. OHS policies	1.1. Bangladesh standards for OHS 1.2. Fire Safety Rules and Regulations 1.3. Code of Practice 1.4. Industry Guidelines
2. Safe operating procedures	2.1 Orientation on emergency exits, fire extinguishers, fire escape, etc. 2.2 Emergency procedures 2.3 First Aid procedures 2.4 Tagging procedures 2.5 Use of PPE 2.6 Safety procedures for hazardous substances
3. Safety signs and symbols	3.1 Direction signs (exit, emergency exit, etc.) 3.2 First aid signs 3.3 Danger Tags 3.4 Hazard signs 3.5 Safety tags 3.6 Warning signs
4. Personal Protective Equipment (PPE)	4.1 Gas Mask 4.2 Gloves 4.3 Safety boots 4.4 Face mask 4.5 Overalls 4.6 Goggles and safety glasses 4.7 Sun block 4.8 Chemical/Gas detectors
5. Hazards	5.1 Chemical hazards 5.2 Biological hazards 5.3 Physical Hazards 5.4 Mechanical and Electrical Hazard 5.5 Mental hazard 5.6 Ergonomic hazard
6. Emergency Procedures	6.1 Fire fighting 6.2 Earthquake 6.3 Medical and first aid 6.4 Evacuation
7. Contingency measures	7.1 Evacuation 7.2 Isolation 7.3 Decontamination
8. “Fit to Work” records	8.1 Medical Certificate every year

	8.2 Accident reports, if any 8.3 Eye vision certificate
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 stated OHS policies and safe operating procedures 1.2 followed safety signs and symbols 1.3 used personal protective equipment (PPE) 1.4 maintained workplace clear and tidy 1.5 assessed and Controlled hazards 1.6 followed emergency procedures 1.7 followed contingency measures 1.8 implemented corrective actions
2. Underpinning knowledge	2.1 Define OHS 2.2 OHS Workplace Policies and Procedures 2.3 Work Safety Procedures 2.4 Emergency Procedures 2.5 Hazard control procedure 2.6 Different types of Hazards 2.7 PPE and there uses 2.8 Personal Hygiene Practices 2.9 OHS Awareness
3. Underpinning skills	3.1 Accessing OHS policies 3.2 Handling of PPE 3.3 Handling cleaning tools and equipment 3.4 Writing report 3.5 Responding to emergency procedures
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Workplace 5.2 Equipment and outfits appropriate in applying safety measures 5.3 Tools, materials and documentation required 5.4 OHS Policies and Procedures
6. Methods of assessment	Competency should be assessed by: 6.1 Written test

	6.2 Demonstration 6.3 Oral Questioning
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Sector Specific Units of Competencies

Unit Code and Title	**SU-FUR-02-L1-V1: Use Measuring Instruments**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use measuring instruments. It specifically includes the tasks of selecting measuring instruments, carrying out measurements and calculation and maintaining measuring instruments.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Select measuring instruments	1.1 Object or component to be measured is identified. 1.2 Correct specifications are obtained from relevant source 1.3 Required **measuring instruments** is selected in accordance with job requirements. 1.4 Measuring instruments are calibrated as per standard if necessary;
2. Carry out measurements and calculation	2.1 Accurate measurements are obtained in accordance with job requirement. 2.2 **Basic calculation** needed to complete work tasks are performed. 2.3 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.4 Numerical calculation is checked and corrected for accuracy in accordance with job requirement. 2.5 Instruments are read according to the limit of accuracy;
3. Maintain measuring instruments	3.1 Measuring instruments are checked for damage prior to storage. 3.2 Measuring instruments are cleaned before and after using.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Measuring instruments	1.1 Measuring tape 1.2 Callipers (inside-outside) 1.3 Vernier Callipers 1.4 Try square 1.5 Steel rule 1.6 T square

2. Basic calculation	2.1 Volume 2.2 Area 2.3 Circumference 2.4 Diameter 2.5 Radius 2.6 Length 2.7 Thickness 2.8 Outside diameter
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 selected measuring instruments 1.2 carried-out measurements and calculations 1.3 maintained measuring instruments.
2. Underpinning knowledge	2.1 Types of measuring tools and equipment. 2.2 Measuring instruments and its use. 2.3 Formula for volume, area, perimeter and other geometric figures.
3. Underpinning skills	3.1 Caring and handling measuring instruments. 3.2 Calibrating and using measuring instruments. 3.3 Performing calculation by addition, subtraction, multiplication and division. 3.4 Interpreting formula for volume, area, perimeter and other geometric figures.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.
5. Resource implication	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 tools, equipment and physical facilities appropriate to perform activities 5.3 materials and consumables needed to perform activities.

6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of Assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	**SU-FUR-03-L1-V1: Interpret Technical Drawing**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to interpret technical drawing. It specifically includes the tasks of selecting technical drawing and interpreting drawing and specifications.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Select technical drawing	1.1 **Drawing** is selected and checked to ensure that it conforms to the job requirements. 1.2 Drawing is validated by the responsible person.
2. Interpret drawing and sketches	2.1 Drawing components and assemblies are identified. 2.2 Dimensions are identified in accordance with job requirement. 2.3 Components, assembles or objects are recognized as required. 2.4 Sketches are identified & interpreted to perform required job. 2.5 Instructions are followed for making pattern 2.6 Material specifications are identified. 2.7 **Symbols** in drawing are identified and interpreted.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Drawing	1.1 Freehand sketch 1.2 Technical drawing: ▪ Isometric view (Top view, side view, back panel, bottom and bit) ▪ Oblique view ▪ Orthographic view
2. Symbol	2.1 Mirror / clear glass 2.2 Lock / handle / knob 2.3 Magnet 2.4 Spot light 2.5 Channel 2.6 Hinge (round / straight / half round) 2.7 Cable passing 2.8 Wood

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.

1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 identified dimension according to job requirement 1.2 recorded clearances and tolerances according to the fit requirement 1.3 interpret drawing symbols.
2. Underpinning knowledge	2.1 Types of drawing. 2.2 Types of symbols. 2.3 Unit of measurements.
3. Underpinning skills	3.1 Interpreting data and instruction given in the drawing. 3.2 Interpreting measurements and scale of drawing.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Environmental concerns. 4.5 Eagerness to learn. 4.6 Tidiness and timeliness. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.
5. Resource implication	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 tools, equipment and physical facilities appropriate to perform activities 5.3 materials and consumables needed to perform activities.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under NSQF/BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set

by NSDA

Occupation Specific Units of Competencies

Unit Code and Title	**OU-FUR-CNCMO-01-L1-V1: Use Hand Tools and Portable Power Tools**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use hand tools and portable power tools. It specifically includes the tasks of preparing for works, using hand tools Operating and maintaining hand and power tools.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Prepare for works	1.1 Occupational Safety and Health (OSH) requirements, are observed 1.2 Tasks are identified. 1.3 Safe work practice is observed and **Personal Protective Equipment (PPE)** is worn as per workplace requirement 1.4 **Hand tools** and **portable power tools** are identified and selected in accordance with the task requirements.
2. Use hand tools safely	2.1 Appropriate hand tools are selected as per job requirement 2.2 Safety precautions are ensured before using hand tools 2.3 Hand tools are checked for proper operation 2.4 Unsafe or faulty hand tools are identified and marked for repair 2.5 Use hand tools safely to perform a work activity
3. Operate power tools safely	3.1 Appropriate power tools are selected as per job requirement 3.2 Power supply outlet and electrical cord are inspected and confirmed safe for use following established workplace safety requirements 3.3 Safety precautions are ensured before using power tools following the manufacturer's operating specifications 3.4 The proper sequence of operation is applied for using power tools 3.5 Unsafe or faulty power tools are identified and marked for repair 3.6 Operate power tools safely to perform a work activity
4. Maintain hand and power tools	4.1 Hand tools and power tools are checked for damage prior to storage. 4.2 Hand tools and power tools are cleaned before and after using. 4.3 Power tools are maintained using relevant lubrications as per manufacturer's instructions. 4.4 Hand tools and power tools are stored in the designated area.
Range of Variables	
Variable	**Range** (may include but not limited to:)

1. Personal Protective Equipment	1.1 Hand gloves 1.2 Helmet 1.3 Apron/Boiler suit 1.4 Googles 1.5 Face masks 1.6 Safety shoes
2. Hand tools	2.1 Ball Pin Hammer 2.2 Mallet 2.3 Measuring tape 2.4 Ruler (Wood and Steel) 2.5 Vernier scale 2.6 Try square 2.7 Screwdriver (Flat and Star) 2.8 Wood files 2.9 Vice 2.10 C-Clamp 2.11 Pincers 2.12 Nail Punch 2.13 Spanner 2.14 Allen Key
3. Portable power tools	3.1 Nail Gun 3.2 Screw Gun 3.3 Stapler Machine 3.4 Blower
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 demonstrated safe working practices 1.2 used hand tools and portable power tools 1.3 maintained and stored hand tools and power tools.
2. Underpinning knowledge	2.1 Safety requirements in handling tools. 2.2 Function, operation and common faults of tools 2.3 Maintenance of tools. 2.4 Storage of tools.
3. Underpinning skills	3.1 Safe handling of tools 3.2 Using and maintaining hand tools and portable power tools. 3.3 Following OSH

4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.
5. Resource implication	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 tools, equipment and physical facilities appropriate to perform activities 5.3 materials, consumables to perform activities.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.3 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.1 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code & Title	**OU-FUR-CNCMO-02-L3-V1: Operate Single Head CNC Machine**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to operate Single Head CNC Machine. It includes preparing for CNC operation, setting- up machine, cutting tools and workpiece, operating single head CNC, checking and measuring workpiece, maintaining and cleaning workplace
Nominal Hours	120 Hours
Elements of Competency	**Performance criteria** **Bold & Underlined** words are detailed in the Range of Variables
1. Prepare for CNC operation	1.1 Safe work practices are observed and **Personal Protective Equipment (PPE)** worn as required for the work place. 1.2 **Tools** and **materials** for CNC operation are selected conforming to the job requirement. 1.3 **Routine maintenance is performed** to prepare the machine for required operation. 1.4 **Necessary Equipment** are collected asper job requirement. 1.5 Work piece or object to be Cut is identified and selectedagainst specifications. 1.6 Drawings are interpreted to produce component to specifications.
2. Set- up machine, cutting tools and workpiece	2.1 Appropriate Cutter is selected, checked, sharpened and **Setup** with the Head of the machine. 2.2 Cutter settings and adjustment is monitored as required. 2.3 **Work holding and clamping devices** are tightened according to standard operating procedures. 2.4 The work piece is tightened with bed using nail gun machine. 2.5 Machines are checked and adjusted as per requirement. 2.6 Any **Faults** are detected and reported to concern supervisor for repair or maintenance in accordance with organizational policies and procedures
3. Operate Single Head CNC	3.1 Power button is ON of the Single Head Machine 3.2 Program Files are input, selected and checked. 3.3 XYZ axis in Origin/Zeroposition is set for operation. 3.4 Thickness is selected using Z axis 3.5 Digital Signal Process (DSP) is used to continue operation 3.6 Test cutting work piece is observed carefully and kept record of deficiency, if any. 3.7 Cutting products are verified with specific format and acceptable standards.

4. Check and measure workpiece	4.1 Workpiece is checked and measured in conformance to specification using appropriate methods, **measuring tools** and equipment. 4.2 Defective workpieces are marked, recorded and reported for proper action.
5. Maintain and Clean Workplace	5.1 Machine and Work Area is cleaned according to Workplace Procedures after completion of work. 5.2 Cutting Tools are checked and sent for sharpening/servicing 5.3 Maintenance is done as per the workplace standard. 5.4 Tools and equipment are stored in specified area according to workplace procedure. 5.5 Products are stored in right way as per required. 5.6 Waste materials are disposed of in accordance with environmental requirements.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Personal Protective Equipment(PPE)	1.1 Dust and Contamination protected Mask 1.2 Hand gloves 1.3 Head cover 1.4 Foot wear/Gum Boot 1.5 Ear muff/Plug 1.6 Eye protector/Goggles 1.7 Dust collector
2. Tools, Equipment and Materials	2.1 Slide Wrench 2.2 Ball Pin Hammer 2.3 Mallet 2.4 File 2.5 Flat screwdriver 2.6 Allen Key 2.7 Pliers 2.8 Nail Gun 2.9 Nail 2.10 Nail Remover 2.11 Air Compressor 2.12 Wood/Board/PVC 2.13 Air gun
3. Routine checkup	3.1 Checking and adjust machine 3.2 Checking and use lubricant 3.3 Checking & adjusting air pressure 3.4 Checking machine performance

4. Set up	4.1 Safety guard. 4.2 Machine parts adjustment 4.3 Tightening cutter 4.4 Set up wood/board 4.5 Set cutter axis as per required.
5. Work holding and clamping devices	5.1 C-Clump 5.2 Vacuum compressor 5.3 Nail
6. Faults	6.1 XYZ axis of Single Head CNC Machine is not set accordingly. 6.2 Machine is not work accurately due to unsharpened/blunt cutter. 6.3 Damage of cutter due to nail on wood/board. 6.4 Loose cutter due to poor fitting.
7. Measuring tools	7.1 Vernier caliper (Digital or read out) 7.2 Measuring tape
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent andmeet all requirements of current version of the Unit of Competency.	
1. Critical aspectsof competency	Assessment required evidences that the candidate: 1.1 Followed safety procedures throughout the job. 1.2 Checked the work piece for cracks, nails, buds anddamaged area. 1.3 Set up and operated Single Head CNC machine 1.4 Smoothened the surface of work piece without damagingcutting tools and work piece. 1.5 Cleaned and lubricated machine as per user manuals.
2. Underpinning knowledge	2.1 Types, use and limitations of Single Head CNC Machine. 2.2 Different parts and its functions of Single Head CNCmachine. 2.3 Concept on XYZ axis. 2.4 Importance of cutter sharpness. 2.5 Precaution to be taken while checking the sharpness of thecutter.
3. Underpinningskills	3.1 Checking of machine lubrication 3.2 Checking cutter sharpness 3.3 Selection of quality work piece for cutting 3.4 Steps of setting Single Head CNC machine 3.5 Operation of Single Head CNC machine. 3.6 Setting machine components as per work piecerequirement. 3.7 Wood/board setting process and technique using singlehead CNC machine.

4. Required attitudes	3.1 Commitment to occupational safety and health. 3.2 Eagerness to learn. 3.3 Promptness in carrying out activities. 3.4 Tidiness and timeliness. 3.5 Sincere and honest to duties. 3.6 Environmental concerns. 3.7 Respect to rights of peers and seniors at workplace. 3.8 Communication with peers and seniors at workplace.
5. Resource implications	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 requiredtoolsandequipment,facilitiesandrelevantresources for Furniture sector 5.3 consumables materials to perform activities 5.4 required teaching aids, learning materials.
6. Methods of assessment	Methods of assessment may include but not limited to: 7.1 written test 7.2 demonstration 7.3 oral questioning 7.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code & Title	**OU-FUR-CNCMO-03-L3-V1: Operate CNC Lathe Machine**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to operate CNC wood lathe Machine. It includes repairing for CNC operation, Setting- up machine, and workpiece, operating CNC lathe and maintaining tools, equipment and workplace
Nominal Hours	**100 Hours**
Elements of Competency	**Performance Criteria** **Bold &Underlined** terms are elaborated in the Range ofVariables
1. Prepare for CNC lathe operation	1.1 Safe work practices observed and **Personal Protective Equipment (PPE)** worn as required for the work performed. 1.2 **Tools** and **materials** for CNC operation are selected conforming to the job requirement. 1.3 **Routine maintenance is performed** to prepare the machine for required operation. 1.4 **Necessary Equipment** are collected asper job requirement. 1.5 Work piece or object to be Cut is identified and selected against specifications. 1.6 Drawings are interpreted to produce component to specifications.
2. Set- up machine, and workpiece	2.1 **Work holding and clamping devices** are tightened according to standard operating procedures. 2.2 The work piece is tightened with chuck 2.3 Machines are checked and adjusted as per requirement. 2.4 Any **Faults** are detected and reported to concern supervisor for repair or maintenance in accordance with organizational policies and procedures 2.5 Parameters are measured as per job requirement.
3. Operate CNC Lathe	3.1 Power button is ON of the CNC Lathe Machine 3.2 Program Files are inputted, selected and checked. 3.3 XYZ axis is in Origin/Zero position. 3.4 Speed is controlled as required. 3.5 Auto button is Clicked 3.6 Work piece is fixed up with the object of machine 3.7 Work piece is rolled/rotted on 3.8 Start Button is pressed 3.9 Test cutting work piece is observed carefully and keeprecord of deficiency, if any. 3.10 Cutting products are verified with specified format and acceptable standards.

4. Maintain tools, equipment and workplace	4.1 Machine and Work Area is cleaned according to workplace procedures after completion of work. 4.2 Cutting tools are checked and sent for sharpening 4.3 Tools and equipment are cleaned and stored in specified locationaccording to workplace procedure. 4.4 Products are stored in right way as per workplace procedure. 4.5 Waste materials are removed from workplace. 4.6 Waste materials are disposed of in accordance with environmental requirements.

Range of Variables

Variable	**Range** (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Dust and Contamination protected Mask 1.2 Hand gloves 1.3 Head cover 1.4 Foot wear 1.5 Ear muff/Plug 1.6 Gum Boot 1.7 Eye protector 1.8 Dust collector
2. Routine checkup	2.1 Checking and adjust machine 2.2 Checking and use lubricant 2.3 Checking & adjusting air pressure 2.4 Checking machine performance
3. Tools, Equipmentand Materials	3.1 Slide Wrench 3.2 Allen Key 3.3 Pliers 3.4 Air Compressor 3.5 Wood
4. Work holding and clamping devices	4.1 Lathe Chucks 4.2 Clamps and Straps 4.3 Vacuum Chucks 4.4 Soft Jaws
5. Faults	5.1 XYZaxisofCNCLatheMachineisnotsetaccordingly. 5.2 Machine is not work accurately due to improper sharpened cutter. 5.3 Loose cutter due to poor fitting.

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent, recent andmeet all requirements of current version of the Unit of Competency.

1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 Followed safety procedures throughout the job. 1.2 Checked the work piece for cracks, nails, buds and damaged area. 1.3 Set up and operated CNC machine 1.4 Smoothened the surface of work piece without damaging cutting tools and work piece. 1.5 Cleaned and lubricated machine as per user manuals.
2. Underpinning knowledge	2.1 The types, use and limitations of CNC Lathe Machine. 2.2 Different parts and its functions of CNC Lathe machine. 2.3 X, Y and Z axis. 2.4 Importance of cutter sharpness. 2.5 Precaution to be taken while checking the sharpness of the cutter. 3 Work holding and clamping devices 4 Necessity of work piece is tightening 5 Machines are checking and adjusting procedure 6 Different types of Faults 7 Parameters of CNC Lathe
3. Underpinningskills	3.1 Checking of machine lubrication 3.2 Checking cutter sharpness 3.3 Identification of quality work piece for cutting 3.4 Steps of setting CNC Lathe machine 3.5 Operation of CNC Lathe machine. 3.6 Setting machine components as per work piece requirement. 3.7 Wood/board setting process and technique using CNC Lathe machine.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Eagerness to learn. 4.3 Promptness in carrying out activities. 4.4 Tidiness and timeliness. 4.5 Sincere and honest to duties. 4.6 Environmental concerns. 4.7 Respect to rights of peers and seniors at workplace. 4.8 Communication with peers and seniors at workplace.
5. Resource implications	The following resources must be provided: 5.1 workplace (actual or simulated) 5.2 required tools and equipment, facilities and relevant resources for Furniture sector 5.3 consumables materials to perform activities 5.4 required teaching aids, learning materials.

6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

References

1. Competency Standard on CNC Machine Operation (Wood Work) of BTEB

Development of Competency Standard

The Competency Standards for National Skills Certificate Level-3 in **CNC Machine Operation (Wood)** is Developed by NSDA on 11-15 July, 2024.

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Validation of Competency Standard

The Competency Standards for National Skills Certificate Level-3 in CNC Machine Operation (Wood) is Validated by NSDA on 18 August, 2024

List of Members of the Validation Workshop

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