TRAINING PROGRAM SYLLABUS

NC/CNC Machining Operator Training and Certification

(Pelatihan dan Sertifikasi Operator Pemesinan NC/CNC)

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1. General Information

Training Program Name : NC/CNC Machining Operator Training and Certification

Program Code **:** MK-003

Training Category **:** Micro Credential Training Program

Program Graduate Profile

Entry-level NC/CNC machining operator able to prepare work, set up the designated machine under supervision, adjust approved programs and monitor a basic machining cycle safely.

Short Description

A 48-JP workshop-oriented NC/CNC operator programme integrating safety, drawings, dimensional checks, conventional workshop preparation, setup, program adjustment and basic machining.

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2. Detailed Description

Duration **:** 48 JP

Full Description

A 48-JP competency-based practical programme aligned with nine competency units in the NC/CNC Machine Operator scheme. The syllabus follows two occupational work groups: NC/CNC Machine Setup (technical drawings, machine setup, program editing, general mechanical machines and hand tools) and Machine Operation (OHS, operation and monitoring, measurement and quality procedures). Each topic corresponds to one competency unit with defined learning and assessment evidence. BNSP certification requires a separate assessment by an authorized LSP.

Participant Requirements

Basic workshop and machining knowledge is recommended. Participants should be prepared for hands-on machine practice and comply with applicable workshop and machine safety requirements.

Certification

Target BNSP NC/CNC Machining Operator, subject to a separate LSP competency assessment. Completion of training does not guarantee certification.

Trainer Qualifications

Machining trainer with demonstrated NC/CNC setup and operation experience, technical drawing and measurement skills, and competence in safe workshop instruction and practical assessment.

Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.
2. Prepare tooling and work holding and set up NC/CNC machines and authorized existing programs.
3. Operate and monitor a basic machining cycle and verify the resulting workpiece.

3. Training Materials

Module 1 : NC/CNC Machine Setup

Topic 1.1 : Reading Technical Drawings

Summary : Competency Unit C.28LOG09.002.2 (Reading Technical Drawings). Covers component views, dimensions, tolerances, datum references and machining notes relevant to setup and inspection.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.1. Interpret the essential machining and inspection requirements of an assigned drawing.

Topic Duration : 3 JP

Learning Method : Guided drawing interpretation and setup-sheet annotation.

Assessment Method : Drawing interpretation worksheet.

Assessment Indicators : Identifies critical dimensions, tolerances, surfaces and datum information.

Assessment Weight : 6%

Material : —

Learning Material : —

Topic 1.2 : Setting Up NC/CNC Machines

Summary : Competency Unit C.28LOG07.014.2 (Setting Up NC/CNC Machines). Reference and datum setting, tools and tool offsets, clamping and workholding, NC/CNC pre-run checks and safe dry-run verification, following the manufacturer-authorized instructions.

Topic Learning Outcomes

2. Prepare tooling and workholding and set up NC/CNC machines and authorized existing programs.

2.1. Set up the specified NC/CNC machine, workholding, tools and offsets in accordance with an approved job sheet.

Topic Duration	: 8 JP
Learning Method	: Instructor demo, supervised setup and pre-run verification.
Assessment Method	: Observed machine-setup practical.
Assessment Indicators	: Offsets, tools, work holding and safety checks match the approved job sheet.
Assessment Weight	: 16%
Material	: —
Learning Material	: —

Topic 1.3	: Setting Up and Editing Programs on NC/CNC Machines
Summary	: Competency Unit C.28LOG07.015.2 (Setting Up and Editing Programs on NC/CNC Machines). Selecting/loading approved programs, checking toolpaths and safe limits, controlled edits, approvals and trial execution. Does not claim full independent CNC program creation.

Topic Learning Outcomes

2. Prepare tooling and work holding and set up NC/CNC machines and authorized existing programs.

2.2. Set and edit an authorized NC/CNC machine program and verify it safely before operation.

Topic Duration	: 7 JP
Learning Method	: Program walk-through, supervised control-panel practice and simulation/dry run.
Assessment Method	: Program verification exercise.
Assessment Indicators	: Edit, toolpath checks and approval records conform to the assigned procedure.
Assessment Weight	: 15%
Material	: —
Learning Material	: —

Topic 1.4 : Operating General Mechanical Machines

Summary : Competency Unit C.28LOG07.004.2 (Operating General Mechanical Machines). Provides relevant supervised practice with conventional machine operations and work holding used in basic machining preparation.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.2. Operate a general mechanical machine safely to complete an assigned preparation task.

Topic Duration : 5 JP

Learning Method : Machine demonstration, staged individual practice and inspection.

Assessment Method : Workshop practical exercise.

Assessment Indicators : Workpiece preparation and machine use satisfy safety and job requirements.

Assessment Weight : 10%

Material : —

Learning Material : —

Topic 1.5 : Using Hand Tools

Summary : Competency Unit C.28LOG18.001.2 (Using Hand Tools). Covers selecting and safely using basic hand tools for deburring, handling and preparing machining work.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.3. Use designated workshop hand tools safely for a defined preparation task.

Topic Duration	: 2 JP
Learning Method	: Tool selection demonstration and supervised bench exercise.
Assessment Method	: Hand-tool practical observation.
Assessment Indicators	: Selects suitable tools and completes the task without unsafe handling.
Assessment Weight	: 3%
Material	: —
Learning Material	: —

Module 2 : Machine Operation

Topic 2.1 : Applying Occupational Safety and Health Principles in the Workplace

Summary : Competency Unit C.28LOG20.003.2 (Applying Occupational Safety and Health Principles in the Workplace). Reviews shop hazards, machine guarding, PPE, emergency stop, lockout rules and operator responsibilities.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.4. Apply workshop OHS procedures and demonstrate safe pre-operation CNC machine checks.

Topic Duration : 3 JP

Learning Method : Safety induction, machine walk-through and checklist practice.

Assessment Method : Observed pre-start safety check.

Assessment Indicators : Identifies hazards and follows relevant machine safety and emergency controls.

Assessment Weight : 5%

Material : —

Learning Material : —

Topic 2.2 : Operating and Monitoring Basic Machines/Processes

Summary : Competency Unit C.28LOG07.022.2 (Operating and Monitoring Basic Machines/Processes). Controlled NC/CNC cycles, operator monitoring, alarms and stop rules, in-process dimensional checks, quality records, material handling and safe machine shutdown.

Topic Learning Outcomes

3. Operate and monitor a basic machining cycle and verify the resulting workpiece.

3.1. Operate and monitor a basic NC/CNC machining process and verify the workpiece against its drawing.

Topic Duration : 14 JP

Learning Method : Supervised production run, in-process checks and final integrated practical.

Assessment Method : Integrated machining practical and workpiece inspection.

Assessment Indicators : Follows run safeguards; records observations and verifies critical part dimensions.

Assessment Weight : 35%

Material : —

Learning Material : —

Topic 2.3 : Measuring Using Measuring Instruments

Summary : Competency Unit C.28LOG12.008.2 (Measuring Using Measuring Instruments). Practices reading vernier callipers, micrometres and other selected shop measuring devices and comparing results to tolerance.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.5. Measure a sample workpiece and determine its conformity to a stated dimension.

Topic Duration : 4 JP

Learning Method : Instrument demonstration, supervised measurement and error review.

Assessment Method : Measurement practical test.

Assessment Indicators : Measurements are recorded with units and checked against stated tolerance.

Assessment Weight : 7%
Material : —
Learning Material : —

Topic 2.4 : Applying Quality Procedures
Summary : Competency Unit C.28LOG15.002.2 (Applying Quality Procedures). Introduces in-process quality control, job documentation, workpiece identification and recording of nonconformities.

Topic Learning Outcomes

1. Apply machining safety, quality, technical drawing and measurement practices when preparing work.

1.6. Apply the required quality-control procedure and document the inspected machining result.

Topic Duration : 2 JP
Learning Method : Quality sample review and completed record demonstration.
Assessment Method : Job quality-record exercise.
Assessment Indicators : Documents the specified feature, result and appropriate disposition.
Assessment Weight : 3%
Material : —
Learning Material : —

4. Card Publication

Target Participants	:	Prospective and junior NC/CNC machine operators, machining and production technicians, vocational students, and instructors involved in manufacturing or machining operations.
Learning Media & Facilities	:	Requires supervised access to suitable NC/CNC machine(s), approved workpieces and cutting tools, measuring instruments, setup sheets, machine manuals, guards and PPE; actual machine and material availability must be confirmed.
Program Advantages	:	Integrated competency-based training that combines machining fundamentals with practical NC/CNC machine setup, program adjustment, operation, and process monitoring, while supporting participant readiness for competency certification.

5. Supporting Documents

Training Agenda	:	—
Training Syllabus	:	—
Training Flyer	:	MK003_CNC Turning and Milling Operator Training and Certification (English).pdf

TRAINING PROGRAM SYLLABUS APPROVAL PAGE

NC/CNC Machining Operator Training and Certification

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