



Machining Level 1 & 2

National certifications
based on industry-written,
industry-approved
standards



Industry-Written, Industry-Approved

Machining Level 1 & 2 Standards

Duty Areas, Knowledge, Skills, and Abilities



Industry-Written, Industry-Approved

Machining Level 1 & 2 Credentials

- Twenty areas of focus
 - CNC Milling: Operator
 - CNC Milling: Programming Setup & Operations
 - CNC Milling Skills II
 - CNC Turning: Operator
 - CNC Turning: Programming Setup & Operations
 - CNC Turning Skills II
 - Drill Press Skills I & II
 - EDM 2 Axis Wire
 - EDM Plunge
 - Grinding Skills I & II
 - Job Planning, Benchwork & Layout
 - Manual Milling Skills I & II
 - Measurement, Materials & Safety
 - Turning Operations: Turning Between Centers I & II
 - Turning Operations: Turning Chucking Skills I & II

MODULAR DESIGN

(earn in any order)

Certification Toolkit

translates credentials into:

Applied Mathematics

Cutting Tool Assembly

Geometrical Dimensioning and Tolerancing

Inspection

Machine Maintenance

Machine Safety

Machining Applications

Measurements


Operations

Print Reading

Shop Safety

Selecting Credentials

[View/Download the Certification Toolkit](#)



Machining Level I Credential Overview CNC Milling: Operations

OVERVIEW This certification validates that an individual is able to successfully machine parts by operating a computer numerical control (CNC) machine; maintain quality and safety standards; keep records; maintain equipment and supplies; and perform routine preventative maintenance.

COMPETENCIES	KNOWLEDGE + SKILLS	
Applied Mathematics	Arithmetic IPM Calculations SFM to RPM Conversion	Sign Numbers Use of Scientific Calculator
Cutting Tool Assembly	Configuration (LOC and EOH) Fitting (tightening and setting) Holder Applications	Inspection of Cutters Inspection of Holders
Geometrical Dimensioning and Tolerancing	Feature Control Frame Geometric Control Symbols Geometric Tolerancing Categories	Geometric Tolerancing Characteristics Geometric Tolerancing Zone Shapes Symbols Associated with Feature Control Frames
Inspection	Feature with Size Verification Feature without Size Verification Flatness Verification Hole Gaging	Perpendicularity Verification Position Verification Profile of a Surface Verification Surface Finish Verification
Machine Maintenance	Coolants Oils and Lubrications	Refractometer Readings
Machine Safety	Machine Guarding	
Machining Applications	Drilling Face Milling Peripheral Milling	Pocket Milling Reaming Tapping
Measurements	Reading Micrometers Reading Steel Rule Reading Vernier Scales Use of Calipers	Use of Dial Indicators Use of Drop Indicators (travel dial) Use of Micrometers Use of Steel Rules
Operations	Deburring Fixture Offset Adjustments Geometry Offset Adjustments Machine Controls	Machine Start-up and Shutdown Machine Warm Up Part Loading (vise/fixture) Tool Height Offset Adjustments
Print Reading	Block Tolerances Line Types and Conventions Orthographic Projection	Surface Finish Requirements Title Blocks and Revisions

...ial Overview

ns: Turning Chucking Skills

...an individual has the skills and knowledge to planning, basic chucking applications, ma-
...ection techniques and safety standards.

SFM to RPM Conversion
Use of Scientific Calculator

Inspection of Holders

Manufacturers Technical Data References

Geometric Tolerancing Categories
Geometric Tolerancing Characteristics
Geometric Tolerancing Zone Shapes
Symbols Associated with Feature Control Frames

Surface Finish Verification
Thread Gaging
Total Runout Verification

Refractometer Readings

ID Threading
OD Grooving
OD Threading
OD Turning

Sawing Blanks

Use of Dial Indicators
Use of Drop Indicators (travel dial)
Use of Micrometers
Use of Steel Rules

Part Loading (chuck/collet)

Surface Finish Requirements
Title Blocks and Revisions

Roles & Set Up

1. Organization: Your school or company
2. Sponsors: Individuals who oversee the performance assessment
(Teachers, trainers, etc.)
3. Proctors: Organization employees who administer the theory assessment
4. Candidates: Individuals pursuing NIMS credentials
(students, employees, apprentices, etc.)

1. Register your organization and primary point of contact (POC)

Who should complete this registration?	The individual who will oversee all NIMS activities at your location
Examples	In Education Setting → Lead Instructor, Dean, Department Head, etc. In Industry Setting → Training Manager, HR Manager, Supervisor, etc.
Responsibility	Oversee NIMS activity and coordinate payment
Registration & Fees	Complete the online Organization Registration (\$0)
Account Functionality	<ul style="list-style-type: none"> • Register new sponsors • View registered sponsors and their candidates • Access <i>Resources</i> page

2. Register your sponsor(s)

Who should complete this registration?	The individual(s) who will oversee performance assessments
Examples	In Education Setting → Instructor, Teacher, Teaching Assistant, etc. In Industry Setting → Trainer, Training Supervisor, etc.
Responsibility	Oversee candidates' performance assessment activities Sign <i>CAR Affidavits of Successful Completion</i> and send to NIMS Schedule theory testing time and date with proctor(s)
Registration & Fees	<ol style="list-style-type: none"> 1. POC logs into the NIMS site. 2. Clicks <i>Add a Sponsor</i> and completes registration form (\$0). 3. Repeat until all sponsors are registered.
Account Functionality	<ul style="list-style-type: none"> • View candidate profiles (includes earned credentials) • Access <i>Resources</i> page
Note	Sponsors ARE NOT REQUIRED to test for NIMS credentials

3. Register your proctor(s)

Who should complete this registration?	The individual(s) who will oversee theory assessments. NOTE: Sponsors cannot serve as proctors.
Examples	In Education Setting → Administrator, testing center personnel, instructors of other subjects, etc. In Industry Setting → HR personnel, administrative personnel, etc.
Responsibility	Oversee all theory assessments: <ul style="list-style-type: none"> • Verify candidate identify • Assist candidate in logging in and purchasing appropriate exam • Enter confidential proctor code unlock exam
Registration & Fees	Proctors must complete online registration (\$0) prior to theory testing <ul style="list-style-type: none"> • Proctor ID: enter first initial and full last name as one word • Proctor Code: enter confidential code of your choosing; this code will be requested anytime an theory exam is taken NOTE: Proctors do not log in at test time; do not receive a username/password.
Tip	Register multiple proctors

4. Register your candidate(s)

Who should complete this registration?	The individual(s) who is pursuing NIMS credentials
Examples	In Education Setting → Student, apprentice, etc. In Industry Setting → Apprentice, trainee, employee, etc.
Responsibility	<ol style="list-style-type: none"> 1. Successfully complete performance assessment 2. Successfully complete theory assessment
Registration & Fees	Candidates must complete online registration (\$40) prior to attempting their first theory assessment NOTE: Registration is required once per candidate; Candidates are not required to re-register if multiple credentials are being pursued.
Note	Prior to registration: ensure candidate has an active, accessible email address

Earning Credentials

Two-Step Validation Process



Performance Types

Measurement, Materials, and Safety does not include a performance assessment.

- Demonstrate hands-on knowledge, skills, and abilities by completing a CAR or industry-designed project

CARs

CNC Milling: Operator

CNC Turning: Operator

Industry-Designed Project

CNC Milling: Programming Setup & Operations

CNC Milling Skills II

CNC Turning: Programming Setup & Operations

CNC Turning Skills II

Drill Press Skills I & II

EDM 2 Axis Wire

EDM Plunge

Grinding Skills I & II

Job Planning, Benchwork & Layout

Manual Milling Skills I & II

Turning Operations: Turning Between Centers I & II

Turning Operations: Turning Chucking Skills I & II

Validation #1a

Performance: CARs

Applies to **CNC Milling: Operator** and **CNC Turning: Operator**

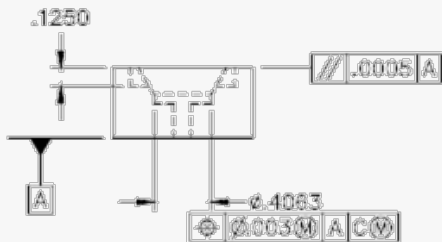
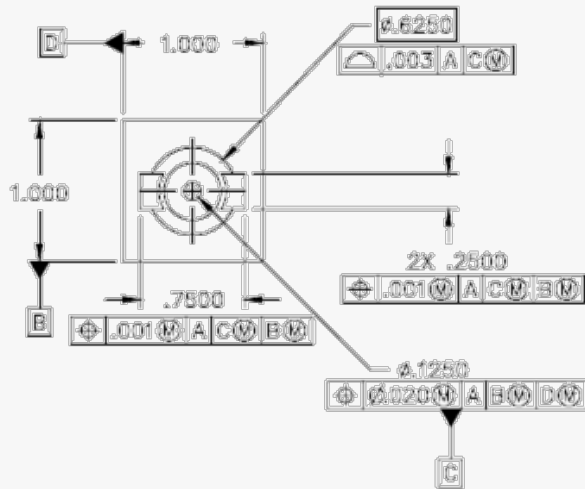
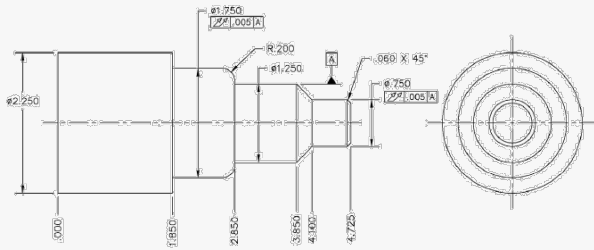
- Candidate demonstrates the use of the jog controls on the operator panel to jog the mill's axes. Also will demonstrate the use of the MPG (Manual Pulse Generator) or hand wheel to jog the axes of the CNC mill.
- Candidate has demonstrated the ability to locate, assemble, and measure tooling using a presetter, or other means, according to work instructions and job documentation.
- Candidate has successfully installed in the automatic tool changer locations, tools and tool holders, according to work instructions and job documentation.
- Candidate has properly located, assembled, and installed the workholding fixture according to work instructions and job documentation.
- Candidate has safely aligned the workpiece in the fixture and secured the workpiece in the fixture using the specified clamping method.
- Candidate safely locates and sets workpiece zero on a CNC mill.
- Candidate properly sets any required work offsets for the part to be machined after a basic tool setting process has been completed.
- Candidate sets the proper geometry/tool offsets for each tool in a standard tool setting process

- Demonstrate hands-on knowledge, skills, and abilities by completing a checklist of skills checks
 - Follow *Credentialing Achievement Record* (CAR)
 - Download CAR from *Resources* page (requires login)
 - Candidates complete CARs:
 - At school/company facility
 - Without assistance
 - Under sponsor supervision
 - No attempt limit; no time limit
 - Send *Affidavit of Successful Completion* to NIMS using the *Affidavit Upload Portal* at <https://goo.gl/bVTc6u>

Validation #1b

Performance: Project

Applies to all **other Machining Level I and II** credentials



- Demonstrate hands-on knowledge, skills, and abilities by machining a specific part using a NIMS-issued print and associated guidelines
- Level I Projects: no time limit
Level II Projects: time limit noted on print
- Candidates complete projects:
 - At school/company facility
 - Without assistance
 - Under sponsor supervision
- When complete, sponsors arrange inspection as follows:

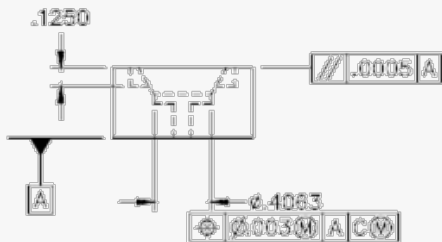
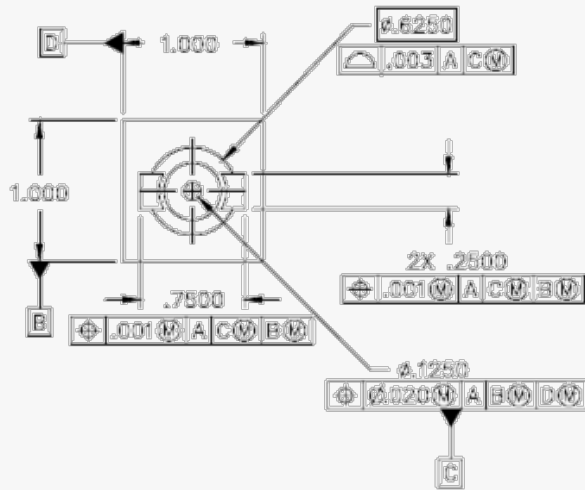
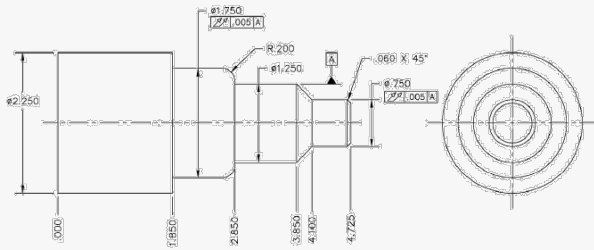
Performance: Project Inspection

Inspection in an EDUCATION Setting	Inspection in an INDUSTRY Setting
<p>Measurement, Materials, and Safety No performance assessment; skip to theory.</p>	<p>Measurement, Materials, and Safety No performance assessment; skip to theory.</p>
<p>Job Planning, Benchwork, and Layout Requires two projects; both may be inspected by sponsors.</p>	<p>Job Planning, Benchwork, and Layout Requires two projects; both may be inspected by sponsors.</p>
<p>All other Machining I and II credentials* require inspection by two MET-TEC Committee members.</p> <p>*Excludes CNC Milling: Operator and CNC Turning: Operator</p> <p>A MET-TEC Committee is a group of local industry reps who inspect candidate projects as needed. See guidelines and registration (\$0) form.</p>	<p>All other Machining I and II credentials* require inspection by two MET-TEC Committee members.</p> <p>*Excludes CNC Milling: Operator and CNC Turning: Operator</p> <p>A MET-TEC Committee is a group of company quality/inspection employees who inspect candidate projects as needed. See guidelines and registration (\$0) form.</p>

Validation #1b

Performance: Project

Applies to all **other Machining Level I and II** credentials

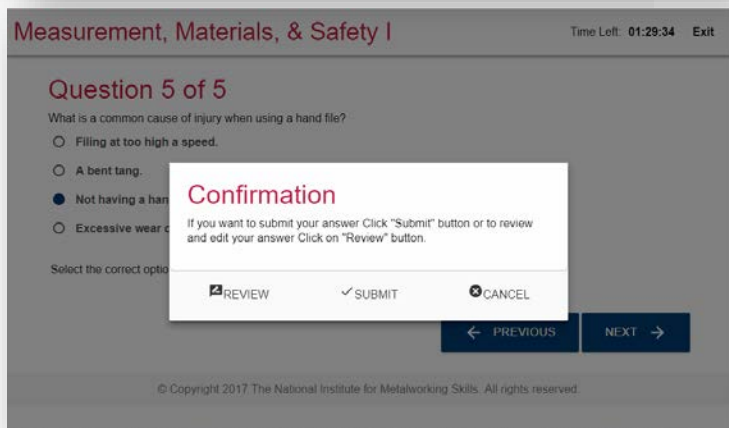
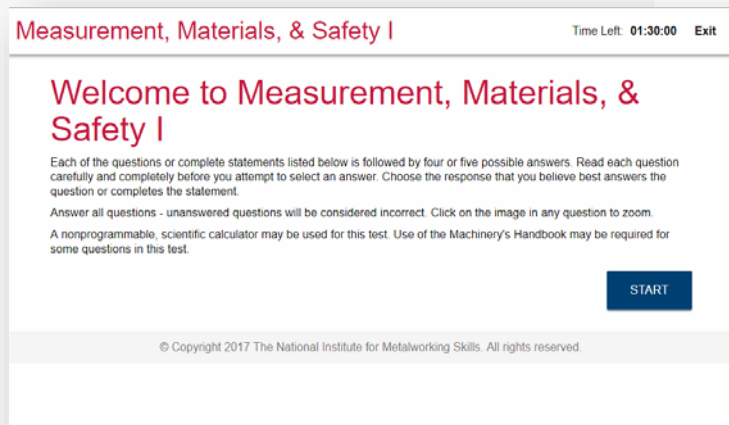


- When inspection is complete and the part is considered to be passing, send the *Affidavit of Successful Completion* to NIMS
 - Use the new *Affidavit Upload Portal* at <https://goo.gl/bVTc6u>

Validation #2

Theory

Applies to all **Machining Level I and II** credentials



- Demonstrate theoretical knowledge, skills, and abilities through completion of a proctored, timed theoretical assessment
- Exams administered at your location
 - Accessed via NIMS website
 - Proctor required
 - Multiple choice, true/false, fill-in-the-blank, etc.
 - 90-minute time limit
 - Immediate results (pass/fail)
- Accommodations available (readers, paper tests, etc.)
- Retakes available anytime
- \$35 per level one; \$50 per level two (includes retakes)

Credential

- PDF emailed to candidate and sponsor upon passing theory exam
- Nationally recognized
- Portable
- Stackable
- No expiration
- Color PDFs accessible 24/7
(login required)



Fees & Payment Options

Fee	Amount
Candidate Registration	\$40 per candidate
Level I Theory	\$35 per exam, per candidate
Level II Theory	\$50 per exam, per candidate
Level III Theory	\$50 per exam, per candidate

Option 1: Pre-Pay	<ol style="list-style-type: none"> 1. Calculate expected candidate registration costs. 2. Calculate expected theory exam fees. 3. Prior to theory testing: submit payment via check, credit card, or purchase order. (see below)
> Check	<ol style="list-style-type: none"> 1. Mail check to NIMS. 2. NIMS will put funds into an account identified by a 4-digit code. A NIMS rep will contact the organization POC and sponsor(s) with the code. At this time the code may be used.
> Credit Card	<ol style="list-style-type: none"> 1. Call NIMS office with credit card ready. 2. A NIMS rep will put funds into an account identified by a 4-digit code and provide that code. At this time the code may be used. 3. A NIMS rep will email a receipt.
> Purchase Order (PO)	<ol style="list-style-type: none"> 1. Send POs NIMS electronically by visiting the <i>PO Upload Portal</i> at https://goo.gl/bVTc6u. 2. Complete all fields, attach your PO file, and click submit. 3. A NIMS rep will email an account code that can be used to pay fees. An invoice will also be sent.
Option 2: Pay On-Screen	<p>When registering candidates or administering theory exams, have a credit card ready for on-screen payment.</p> <p>The payment screen will require the credit card type, card number, expiration date, and full billing address.</p>

Frequently Asked Questions

Under 18?

Yes, if enrolled in a state-recognized training program

Certified Instructors?

Optional. Exam fees are waived for sponsors who wish to test.

Program Accreditation?

Optional. Not a requirement for testing.

Non-NIMS Projects?

No. Performance assessments must follow CARs or projects.

Theory Before Performance?

No. Performance assessments always occur first.

Proctor Code Sharing?

No. Proctor codes are confidential and may not be shared.

Combo Performance Affidavit?

One affidavit per project.

Theory Exam Retake Window?

Retakes can occur anytime; there is no waiting period. Fees are assessed for each attempt.

How many inspections?

Each project is inspected by two MET-TEC Committee members.

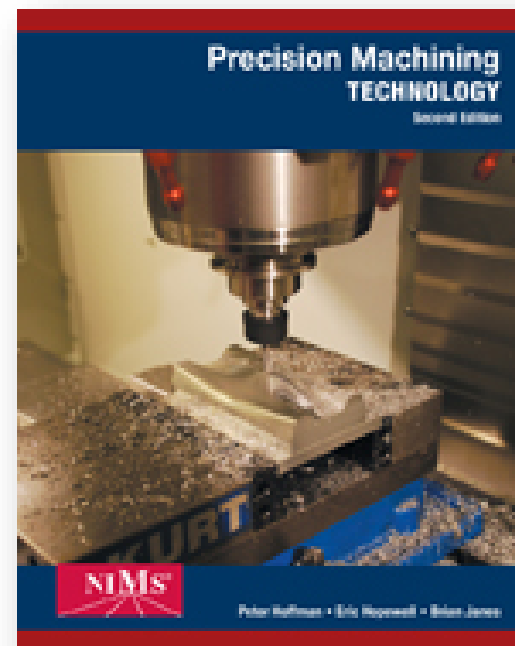
Start with Level 2?

Candidates can earn credentials in any order.

Resources

ISBN-10: 128544454X
ISBN-13: 9781285444543

- NIMS Resources Page [NIMS Resources Page](#) (requires login)
 - CARs
 - Prints and performance affidavits
 - Standards
 - Study guides
- Amatrol
 - [CNC Machine Operator Program \(Classroom Version\)](#)
 - [CNC Machine Operator Program \(Online Version\)](#)
 - [Industrial Technology Maintenance](#)
- Cengage Learning [Precision Machining Technology](#) suite
 - Textbook
 - Workbook and Projects Manual
 - NIMS Study Guide
 - MindTap
- [Immerse2Learn](#)





5-Day Machining Instructor Training Workshop

View other workshops: nimsready.org/workshops

Facilitator-led classroom and hands-on lab time provide:

- Working knowledge of NIMS credentialing and program accreditation
- Best practices for aligning curriculum with NIMS standards and credentials
- Opportunity to earn multiple Machining Level I credentials

Machining Instructor Training workshops are hosted by organizations nationwide that have the machining equipment required to complete the course.

The investment per host organization is \$5,995.

Featuring **INLET**:

Interpret the standards and credential requirements

Learn by planning and earning each level I credential

Extract the skills and knowledge required

Translate into instructional content

Enhanced Training Option



Right Skills Now Model

Manufacturers need the **Right Skills Now**

Principles of Right Skills Now

Fast-Tracked, For-Credit Career Training

– The accelerated route, using modular curriculum, allows individuals to gain credentials with immediate value.

Industry Credentials with Value in the Workplace

– This model allows students to transition to employment while continuing their studies and their accumulation of industry-recognized credentials and credit.

Pathways to Advancement and Degrees

– The hiring employers will emphasize the importance of workers continuing to achieve their educational goals they are working to help them advance within their career pathway.

- Nationally replicable framework for a fast-track CNC operations course or pre-apprenticeship program
- 16- to 24-week hands-on training that provides industry demanded competency-based skills
- Includes advanced manufacturing internship
- Program completers earn:
 - CNC Milling: Operator
 - CNC Turning: Operator
 - Job Planning, Benchwork and Layout
 - Measurement, Materials, and Safety
 - ACT's National Career Readiness Certificate
- Visit [Resources Page](#) to view/print/download Implementation Guide (requires login)

Enhanced Training Option

Help is on the way!

Contact NIMS for support anytime.

email support@nims-skills.org

phone (703) 352-4971

fax (703) 352-4991

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twitter twitter.com/NIMS_Inc

linkedin <http://goo.gl/gCv5Kw>