



# Machining Level I Credential Overview

## CNC Lathe Programming Setup & Operations

### OVERVIEW

This certification validates that an individual is able to setup and operate a CNC Turning Center; maintain quality and safety standards; keep records; maintain equipment and supplies.

### COMPETENCIES

### KNOWLEDGE + SKILLS

<b>Applied Mathematics</b>	Arithmetic IPR Calculations Pythagorean Theorem Right Angle Trigonometry	SFM to RPM Conversion Sign Numbers Use of Scientific Calculator
<b>Cutting Tool Assembly</b>	Fitting (tightening and setting) Inspection of Cutters	Inspection of Holders
<b>Cutting Tool Selection</b>	Cutter Applications Cutter Features/Attributes	Manufacturers Technical Data References
<b>Geometrical Dimensioning and Tolerancing</b>	Datum Reference Frame (DRF) Degrees of Freedom (DOF) Feature Control Frame Geometric Control Symbols	Geometric Tolerancing Categories Geometric Tolerancing Characteristics Geometric Tolerancing Zone Shapes Symbols Associated with Feature Control Frames
<b>Inspection</b>	Feature with Size Verification Feature without Size Verification Runout Verification	Surface Finish Verification Total Runout Verification
<b>Machine Maintenance</b>	Coolants Oils and Lubrications	Refractometer Readings
<b>Machine Safety</b>	Machine Guarding	
<b>Machining Applications</b>	Facing OD Turning	
<b>Measurements</b>	Reading Micrometers Reading Steel Rules Reading Vernier Scales Use of Calipers	Use of Dial Indicators Use of Drop Indicators (travel dial) Use of Micrometers Use of Steel Rules
<b>Operations</b>	Deburring Fixture Offset Adjustments Geometry Offset Adjustments Machine Controls	Machine Startup and Shutdown Machine Warm Up Part Loading (chuck/collet) Workshift Adjustments
<b>Print Reading</b>	Block Tolerances Line Types and Conventions Orthographic Projection	Surface Finish Requirements Title Blocks and Revisions



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COMPETENCIES	KNOWLEDGE + SKILLS	
<b>Process Planning</b>	Machine Configuration Machine Selection	Operation Sequencing Workholding Concepts/Devices
<b>Programming</b>	Cutter Radius Compensation Developing and Interpret Setup Sheets Fixture Offsets Motion Commands Plotting Coordinates	Program Structure and Formats Programming Words (code memory) Rectangular Coordinate System Selecting Program Zero
<b>Setup</b>	Boring Soft Jaws or Collet Machine Controls Mounting Workholding Devices	Program Verification (dry run) Setting Geometry Offset for Center Cutting Tools Setting XZ Geometry Offsets
<b>Shop Safety</b>	Blood Born Pathogen Fire Prevention/Suppression Hazardous Material Identification System (HMIS) Lock Out/Tag Out	Personal Protective Equipment (PPE) Safety Data Sheets (SDS) Waste Removal