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

COMPETENCIES	KNOWLEDGE + SKILLS	
Applied Mathematics	Arithmetic IPM Calculations Pythagorean Theorem Right Angle Trigonometry	SFM to RPM Conversion Sign Numbers Use of Scientific Calculator
Cutting Tool Assembly	Configuration (LOC and EOH) Holder Applications Fitting (tightening and setting)	Inspection of Cutters Inspection of Holders
Cutting Tool Selection	Cutter Applications Cutter Features/Attributes	Manufacturer's Technical Data References
Geometrical Dimensioning and Tolerancing	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 Frame
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 Startup and shutdown Machine warm up Part Loading (vise/fixture) Tool Height Offset Adjustments

CNC Milling: Programming Setup & Operations

COMPETENCIES	KNOWLEDGE + SKILLS	
Print Reading	Block Tolerances Line Types and Conventions Orthographic Projection	Surface Finish Requirements Title Blocks and Revisions
Process Planning	Machine Configuration Machine Selection	Operation Sequencing Workholding Concepts/Devices
Programming	Canned Cycles (holes) 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
Setup	Aligning a Vise/Fixture Establish XY Zero from a Hole Establish XY Zero from Two Surfaces	Machine Controls Program Verification (dry run)
Shop Safety	Blood Born Pathogen Fire Prevention/Suppression Hazardous Material Information System (HMIS) Lock Out/Tag Out	Personal Protective Equipment (PPE) Safety Data Sheets (SDS) Waste Removal