

Specification of Competency Standards
for the Manufacturing Technology.
Unit of Competency.

Functional Area - Product Manufacturing

Title	Perform advanced CNC turning and master various machining parameters to improve quality of mould components
Code	106510L3
Range	This unit of competency is applicable to the product manufacturing departments / production departments of companies engaged in the tooling industries. Practitioners should be capable to understand the principles of advanced CNC turning, and are able to operate CNC turning machines to perform precision turning operations
Level	3
Credit	4
Competency	Performance Requirements - Understand relevant knowledge of advanced CNC turning processes - Understand common specifications and characteristics of threads, include metric, imperial, pipe, trapezoidal, square, ball, and flat threads, and variable lead threads - Understand CAM software for turning, include 3D model programming methods and the application of input / output interface systems - Understand advanced CNC turning programming methods, include curve programming, taper programming, thread programming, and the use of fixed programs, loop programs, and subprograms - Understand functions and applications of cutting fluids, and metal chip disposal methods - Understand calculation of intersection points in geometric shapes - Understand impact of various CNC machine parameters on turning performance and finished product quality - Understand features and operation of tool setters - Understand types and applications of advanced standard fixtures - Understand setup and principles of computer connectivity - Understand characteristics and applications of various special tools and tool carriers - Understand relationship between machining parameters and tool life, include feed rate and cutting speed - Understand intelligent solutions applicable to CNC turning, include data acquisition, data enterprise, and predictive maintenance - Perform advanced CNC turning precision machining - Able to use various measuring instruments to initially measure finished products - Able to program CNC turning tool paths using CAM software according to product requirements - Able to set suitable machining parameters, such as feed rate, cutting speed, etc., under guidance, according to engineering drawings - Able to perform direct numerical control (DNC) at appropriate times, under guidance - Able to set up and use tool setters to automatically correct tool paths - Able to secure thin sheet and complex-shaped workpieces using special fixtures, and perform machine calibration - Able to manage CNC machine tools, include setting and modifying tool life data, under guidance

	• Able to adjust suitable machining parameters under guidance to extend tool life • Able to design and fabricate specific fixtures according to different requirements, under guidance • Able to perform precision CNC turning operations according to engineering drawings • Able to calculate appropriate machining parameters, include feed rate and cutting speed, under guidance, to optimise turning efficiency • Able to select suitable cutting fluids for the job • Able to collect and organise data from CNC turning machines, assess turning quality and equipment performance, and adjust production parameters in real-time to optimise production, according to departmental requirements 3. Professional handling of advanced CNC precision turning • Able to follow safety guidelines for advanced CNC turning operations, include metal chip handling, and comply with design drawings, specifications, and production efficiency requirements
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Able to program complex 3D CNC turning operations under guidance • Able to perform precision turning on complex components and finished products, ensuring compliance with required accuracy, and adjust suitable parameters to extend tool life under guidance • Able to process and organise collected CNC turning data, evaluate turning quality and equipment performance, and adjust production parameters in real-time to optimise production, under guidance
Remark	This is the updated version of UoC 106510L4 Individuals who possess the above knowledge and competency are also required to possess the knowledge and competency of “ Perform basic computer numerical control (CNC) turning machining and master various machining data to improve quality of mould components (106403L3)”