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

Functional Area - Product Manufacturing

Title	Advanced computer numerical control (CNC) multi axis precision milling and cutting
Code	106589L5
Range	This unit of competency is applicable to the production department of the corporation of Tooling Manufacturing Industry. Practitioners should be capable to understand the knowledge of advanced computer numerical control (CNC) multi axis milling and cutting, and also operate the multi axis computer numerical milling machines to carry out advanced multi axis precision milling and cutting
Level	5
Credit	9 （For Reference Only）
Competency	Performance Requirements 1. Understand the techniques and technologies of advanced computer numerical control (CNC) milling and cutting • Understand the applicable four, five-axis computer-aided milling programming software (CAM), including the model programming and the application of output and input interface system CAM • Understand the advanced programming methods of computer numerical control (CNC) multi axis • Understand the application methods of four, five-axis, and the relevant programming methods of milling • Understand the impact of CNC milling on milling effect and finished goods • Understanding the characteristics of tool setter and using methods on multi-axis machining • Understand the processing and measurement methods of rafile and turbine blade • Understand the types and applications of advanced standard fixtures • Understand the function, structure, types and safety precautions of all kinds of fixtures of CNC milling machines • Understand the functions and applications of all kinds of cutting fluid on multi axis milling and the handling methods of metal scraps • Understand the relationship between the different processing parameters of multi axis and tool life • Understand the methods and techniques of calibration and precision correction of CNC multi axis milling machines 2. Carry out advanced computer numerical control (CNC) multi axis precision milling and cutting • According to the finished goods requirements, operate CAM programming software to carry out multi axis milling programming • Apply all kinds of measuring instruments to measure the finished goods accurately • According to engineering design requirements, set the appropriate parameters, such as cutting speed, cutting depth and feed rate • Calculate the appropriate multi-axis milling parameters, including feed rate and cutting speed, so as to optimise the milling efficiency • Set and use the automatic tool path correction of Tool Setter • Manage the tools of multi-axis CNC milling machine, set and modify the tool life data • Design and manufacture specific fixture in accordance with different requirements • Apply simulation program to confirm the availability and feasibility of the program • Use special fixtures to fix the sheet workpiece and complex shape of workpiece, and carry out calibration • According to engineering design requirements, carry out all kinds of CNC multi axis precision milling, such as rafile and turbine blade

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	• According to engineering design requirements, set the appropriate parameters, such as cutting speed, cutting depth and feed rate • Measure the positioning precision, analyse causes of the processing error, and enter the appropriate compensation value to enhance the precision • Select the appropriate tools and processing conditions as a foundation to estimate working hours • According to the drawings, tool motions and milling conditions to estimate the processing time 3. Professional handling of advanced computer numerical control (CNC) multi axis precision milling and cutting • Follow safety guidelines of CNC multi axis precision milling and cutting (such as handling metal scrap produced in the milling process) and related Code of Practice, and in accordance with design drawings, specifications and production efficiency requirements, carry out CNC multi axis precision milling and cutting
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Capable to compile CNC milling machine programming and carry out complex numerical control multi axis precision milling and cutting for finished goods • Capable to carry out multi axis precision milling and cutting for complex parts and finished goods, with the appropriate parameters to extend the tool life • Capable to detect and locate the precision, use the appropriate compensation value to enhance the multi-axis milling precision machining precision
Remark	Person who has the above knowledge and ability should also obtain the knowledge and ability of Intermediate computer numerical control (CNC) precision milling and cutting (106509L4) at the same time.