Specification of Competency Standards
for the Manufacturing Technology
Unit of Competency

Functional Area - Product Manufacturing

Title	Perform coordinate grinding and coordinate boring, and master various machining parameters to improve quality of mould components
Code	106514L3
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 jig grinding and jig boring, and are able to perform various coordinate grinding and boring operations to meet precision and quality requirements for mould components
Level	3
Credit	4
Competency	**Performance Requirements** 1. Understand relevant knowledge of coordinate grinding and coordinate boring processes • Understand types, structures, specifications, and applications of fixtures used in jig grinding and jig boring operations • Understand structure, specifications, drive mechanisms, basic operation principles, and safety regulations of jig grinding and jig boring machines • Understand precision control methods and maintenance procedures for jig grinding and jig boring machines • Understand functions and applications of grinding cutting fluids, and methods for handling metal swarf and grinding dust • Understand characteristics and specifications of jig grinding wheels, include abrasive type, grit size, bond type, hardness, structure, and shape, and the meaning of their specifications • Understand principles of internal stress formation during grinding and the corresponding prevention methods • Understand principles of magnetic attraction and demagnetisation • Understand types, applications, selection, and maintenance of jig boring tools • Understand relationship between machining parameters and tool life in jig boring operations • Understand impact of various machining parameters on grinding and boring quality and efficiency, include grinding / boring speed, feed rate, and cut depth • Understand tool path and grinding wheel trajectory programming methods for CNC jig grinding and boring operations • Understand intelligent solutions applicable to jig grinding and boring machines, include data acquisition, data enterprise, and predictive maintenance 2. Operate coordinate grinding and boring machines • Able to use fixtures to correctly secure various types of workpieces • Able to set suitable machining parameters according to processing requirements, include grinding wheel speed, peripheral speed, and grinding diameter • Able to operate jig grinding and jig boring machines for normal start-up and shutdown, include starting and stopping the machine, changing spindle speed, adjusting peripheral speed, adjusting feed rate, adjusting the angle of grinding wheels for conical hole grinding, controlling depth of cut

	• Able to perform grinding operations such as cylindrical hole grinding, arc-shaped internal and external surface grinding, cnical hole grinding, intermittent or plunge grinding • Able to program tool paths and grinding wheel trajectories for CNC jig grinding and boring machines • Able to identify abnormal conditions based on machine performance, wheel wear, and grinding marks, and address them appropriately • Able to adjust, correct, and maintain jig grinding and boring machines to ensure machining accuracy and machine longevity • Able to process and organise data from CNC jig grinding and boring machines, to evaluate grinding quality and machine performance, and adjust production parameters in real-time to optimise production, according to departmental requirements • Able to retrieve production data from machine PLCs or external sensors 3. Professional handling of coordinate grinding and boring processes • Able to follow safety guidelines and regulations for jig grinding and boring operations, include grinding wheel handling, inspection, and maintenance, 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 tool paths and grinding wheel trajectories for jig grinding and boring operations • Able to operate common jig grinding and boring machines to perform precision grinding and boring, achieving high accuracy and efficiency • Able to handle abnormal situations in jig grinding and boring operations
Remark	This is the updated version of UoC 106514L4