

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

Functional Area - Business Intelligence and Information Technology

Title	Establish “Industry 4.0” architecture to interconnect devices within enterprise, achieve single data source, uncover useful data, and assist enterprise in digital transformation and comprehensive operational improvements
Code	111556L6
Range	This unit of competency is applicable to the business intelligence and information technology departments, product design and development departments, process design and development / engineering departments, and product manufacturing / production departments of companies in the manufacturing technology companies. Practitioners should be capable to establish an “Industry 4.0” framework by utilising appropriate technologies, in accordance with the company’s “Industry 4.0” development strategy
Level	6
Credit	6
Competency	Performance Requirements - Understand relevant knowledge of establish “Industry 4.0” framework - Understand concept, definition, purpose, motivation, challenges, and opportunities for businesses in the future of Industry 4.0 - Understand main steps in building an “Industry 4.0” architecture - Understand composition of cyber-physical system (CPS), include sensing and control layer, network transport layer, and computing and decision-making layer - Understand core technologies of cyber-physical systems, include sensor technology, network communication technology, automatic control technology, and intelligent platform service technology - Understand application scope of core architecture of “Industry 4.0”, include smart solutions, smart innovation, smart logistics, and smart manufacturing - Understand the technologies used in Industry 4.0, include sensors, networks, data, and human-machine interfaces (HMIs) - Establish “Industry 4.0” framework - Able to identify, standardise, integrate, and expand different technology solution providers (include big data, sensors, IoT, manufacturing execution systems, human-machine collaboration systems, etc.), interconnect various devices within enterprise, achieve single data source, discover useful data, and lead the enterprise to transform into a data- driven enterprise - Able to align with enterprise development, starting with visualisation, enhance data usability to improve interpretability, then improve predictability through established patterns and real-world models, and ultimately achieve autonomous operational optimisation through data-driven decision-making - Able to select appropriate sensing technologies to capture physical data, analyse, evaluate, and standardise it, create digital records of physical operations and networks, continuously evaluate and optimise recording methods and scope, establish and update specifications - Able to select and standardise appropriate industrial internet of things (IIoT) technologies enables machines to communicate with each other and share information, allowing for advanced analysis and visualisation of real-time data from different sources

	• Able to utilise cyber-physical systems (CPS) to process, analyse, and evaluate collected data in real time, and control physical entities based on optimal decisions formed by judging data from different systems and environments 3. Professional handling of establish “Industry 4.0” architecture • Able to ensure “Industry 4.0”architecture adapts to the latest developments and is optimised and expanded • Able to prevent any abuse of power or fraudulent activities during the “Industry 4.0” framework development
Assessment Criteria	The integrated outcome requirements of this unit of competency are: • Able to interconnect devices within the enterprise, establish “Industry 4.0” system architecture, achieve single data source, uncover useful data, and assist in enterprise transformation • Able to support company’s development, utilise appropriate technologies, and guide the company from operational visualisation to autonomous operational optimisation
Remark	Cyber-Physical Systems: Cyber -Physical systems are new generation of embedded systems that enable deeper connections between the information and physical worlds. The digital world and mechanical devices interact with the physical world, monitoring and controlling physical (production) processes through feedback loops Individuals who possess the above knowledge and competency are able to support the enterprise to achieve the Industry 4.0 digital maturity level of transparency (2i) to predictability (3i)