

# Manufacturing and Engineering Training Package (Release 2.0)

Companion Volume Implementation Guide

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# MEM Manufacturing and Engineering Training Package Implementation Guide

## Introduction

### Who is this guide for?

The MEM Manufacturing and Engineering Training Package Companion Volume Implementation Guide is designed to assist State and Territory Training Authorities (STAs), regulators, assessors, trainers, Registered Training Organisations (RTOs), employees, students and enterprises in delivering training based on the units of competency and qualifications in the MEM Manufacturing and Engineering Training Package. It provides advice about the structure of the qualifications and their key features, and information on licensing and regulatory requirements.

### Version control

Release	Status	Release Date	Approval process
2.0	Current	26 July 2019	Endorsed 5 April 2019
1.2	Superseded	31 May 2016	ISC Upgrade
1.1	Superseded	16 June 2015	ISC Upgrade
1.0	Superseded	30 April 2015	Endorsed 24 April 2015

## Modification history details

### **MEM Release 2.0**

#### **Endorsed changes**

The MEM Manufacturing and Engineering Training Package Release 2.0 consists of:

- seventeen (17) new qualifications, one (1) updated
- four hundred and forty-six (446) units of competency (introduction of workplace hours)
- fifty-five (55) imported units of competency.

### **MEM Release 1.2 - ISC Upgrades**

- Adjustments to 13 units of competency to reflect changes to Essential Performance Capabilities
- List of prerequisites corrected in MEM10025 Undertake a capstone assessment
- Imported units updated.

**Refer to Appendix 2** for detailed information on the industrial electrician qualification.

### **MEM Release 1.1 – ISC Upgrade**

Correction of list of prerequisites in MEM10025 Undertake a capstone assessment.

### **MEM Release 1**

Initial release.



## Qualifications, Skill Sets and Units of Competency in the MEM Manufacturing and Engineering Training Package – Release 2.0

### MEM Release 2.0 Qualifications

MEM Release 2.0		
Code	Title	Comment
MEM10119	Certificate I in Engineering	Release 1.
MEM20219	Certificate II in Engineering - Production Technology	Release 1.
MEM30119	Certificate III in Engineering - Production Systems	Release 1.
MEM30219	Certificate III in Engineering - Mechanical Trade	Release 1.
MEM30319	Certificate III in Engineering - Fabrication Trade	Release 1.
MEM30619	Certificate III in Jewellery Manufacture	Release 1.
MEM30719	Certificate III in Marine Craft Construction	Release 1.
MEM30819	Certificate III in Locksmithing	Release 1.
MEM30919	Certificate III in Boating Services	Release 1.
MEM31019	Certificate III in Watch and Clock Service and Repair	Release 1.
MEM31119	Certificate III in Engineering - Composites Trade	Release 1.
MEM31219	Certificate III in Engineering – Industrial Electrician	Release 1.
MEM31319	Certificate III in Refrigeration and Air Conditioning	Release 1.
MEM31419	Certificate III in Engineering – Fixed and Mobile Plant Mechanic	Release 1.
MEM31519	Certificate III in Engineering – Toolmaking Trade	Release 1.
MEM31719	Certificate III in Engineering – Casting and Moulding Trade	Release 1.
MEM40119	Certificate IV in Engineering	Release 1.
MEM50119	Diploma of Engineering - Advanced Trade	Release 1.

### MEM Skill Sets

Skill Sets are defined as single units of competency, or combinations of units of competency, from an endorsed Training Package that link to a licensing or regulatory requirement, or a defined industry need.

There are no Skill Sets developed for this release of the MEM Training Package.

## MEM Units of Competency and their prerequisites and points weighting

Code	Title	Prerequisites	Points
MEM03001	Perform manual production assembly	MEM13015 MEM16006	4
MEM03002	Perform precision assembly	MEM13015 MEM16006 MEM18001	4
MEM03003	Perform sheet and plate assembly	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM03004	Perform electronic/electrical assembly (production)	MEM13015 MEM16006	8
MEM03005	Rework and repair (electrical/electronic production)	MEM03004 MEM05001 MEM13015 MEM16006 MEM18001	8
MEM03006	Set assembly stations	MEM11011 MEM13015 MEM16006 MEM18001	2
MEM04001	Operate melting furnaces	MEM11011 MEM13004 MEM13015 MEM16006	4
MEM04002	Perform gravity die casting	MEM11011 MEM13004 MEM13015 MEM16006	2
MEM04003	Operate pressure die casting machine	MEM11011 MEM13004 MEM13015 MEM16006	4
MEM04004	Prepare and mix sand for metal moulding	MEM11011 MEM13015 MEM16006	4
MEM04006	Operate sand moulding and core making machines	MEM11011 MEM13015 MEM16006	8
MEM04007	Pour molten metal	MEM11011 MEM13004	4



Code	Title	Prerequisites	Points
		MEM13015 MEM16006	
MEM04008	Fettle and trim metal castings/forgings	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM04010	Develop and manufacture wood patterns	MEM04018 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	20
MEM04011	Produce polymer patterns	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13003 MEM13004 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	8
MEM04012	Assemble plated patterns	MEM04010 MEM04018 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001	8

Code	Title	Prerequisites	Points
		MEM18002	
MEM04013	Develop and manufacture polystyrene patterns	MEM04010 MEM04018 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	2
MEM04014	Develop and manufacture production patterns	MEM04010 MEM04012 MEM04018 MEM07005 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	8
MEM04015	Develop and manufacture vacuum forming moulds and associated equipment	MEM04010 MEM04011 MEM04018 MEM07005 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13003 MEM13015 MEM14006 MEM16006	6

Code	Title	Prerequisites	Points
		MEM18001 MEM18002	
MEM04016	Develop and manufacture precision models	MEM04010 MEM04011 MEM04012 MEM04013 MEM04014 MEM04015 MEM04018 MEM07005 MEM09002 MEM11011 MEM12003 MEM12006 MEM12023 MEM12024 MEM12026 MEM13003 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM04017	Develop and manufacture gear, conveyor screw and propeller patterns	MEM04010 MEM04018 MEM09002 MEM11011 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM04018	Perform general woodworking machine operations	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM04019	Perform refractory installation and repair	MEM11011 MEM12023	4

Code	Title	Prerequisites	Points
		MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	
MEM04020	Supervise individual ferrous melting and casting operation	MEM04001 MEM04004 MEM04007 MEM04024 MEM04025 MEM09002 MEM11011 MEM12023 MEM12024 MEM13004 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM04021	Supervise individual non-ferrous melting and casting operation	MEM04001 MEM04004 MEM04007 MEM04024 MEM04025 MEM09002 MEM11011 MEM12023 MEM12024 MEM13004 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM04022	Examine appropriateness of methoding for mould design	MEM04024 MEM04025 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	4

Code	Title	Prerequisites	Points
		MEM18001 MSATCM304A	
MEM04023	Undertake prescribed tests on foundry-related materials	MEM11011 MEM12024 MEM12026 MEM13015 MEM16006	4
MEM04024	Produce moulds and cores by hand	MEM11011 MEM13015 MEM16006 MEM18001	4
MEM04025	Produce moulds and cores by hand (advanced)	MEM04024 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	12
MEM05001	Perform manual soldering/desoldering – electrical/electronic components	MEM11011 MEM13015 MEM16006	4
MEM05002	Perform high reliability soldering and desoldering	MEM05001 MEM11011 MEM13015 MEM16006	4
MEM05003	Perform soft soldering	MEM11011 MEM13015 MEM16006	2
MEM05004	Perform routine oxy fuel gas welding	MEM11011 MEM13015 MEM16006	2
MEM05005	Carry out mechanical cutting	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	2
MEM05006	Perform brazing and/or silver soldering	MEM11011 MEM13015 MEM16006	2
MEM05007	Perform manual heating and thermal cutting	MEM09002	2

Code	Title	Prerequisites	Points
		MEM11011 MEM12023 MEM13015 MEM16006	
MEM05008	Perform advanced manual thermal cutting, gouging and shaping	MEM05007 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006	2
MEM05009	Perform automated thermal cutting	MEM11011 MEM12023 MEM13015 MEM16006	2
MEM05010	Apply fabrication, forming and shaping techniques	MEM05037 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	8
MEM05011	Assemble fabricated components	MEM05005 MEM05007 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002  Plus, one or more of, including their prerequisites:  MEM05015 MEM05017 MEM05019	8

Code	Title	Prerequisites	Points
		MEM05055	
MEM05012	Perform routine manual metal arc welding	MEM11011 MEM13015 MEM16006	2
MEM05013	Perform manual production welding	MEM11011 MEM13015 MEM16006	2
MEM05014	Monitor quality of production welding/fabrications	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002  Plus, one or more of, including their prerequisites:  MEM05004 MEM05012 MEM05049 MEM05050 MEM05056 MEM05057	2
MEM05015	Weld using manual metal arc welding process	MEM05012 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05016	Perform advanced welding using manual metal arc welding process	MEM05007 MEM05012 MEM05015 MEM05051 MEM05052 MEM09002	4



Code	Title	Prerequisites	Points
		MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	
MEM05017	Weld using gas metal arc welding process	MEM05050 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05018	Perform advanced welding using gas metal arc welding process	MEM05007 MEM05017 MEM05050 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05019	Weld using gas tungsten arc welding process	MEM05049 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006	4

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002	
MEM05020	Perform advanced welding using gas tungsten arc welding process	MEM05007 MEM05019 MEM05049 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05022	Perform advanced welding using oxy acetylene welding process	MEM05004 MEM05007 MEM05051 MEM05052 MEM05055 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM05023	Weld using submerged arc welding process	MEM05051 MEM05052 MEM05057 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4

Code	Title	Prerequisites	Points
MEM05024	Perform welding supervision	MEM05026 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	12
MEM05025	Perform welding/fabrication inspection	MEM05026 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	12
MEM05026	Apply welding principles	MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	4
MEM05027	Perform aluminothermic welding	MEM11011 MEM13015 MEM16006	2
MEM05036	Repair, replace and/or modify fabrications	MEM05005 MEM05007 MEM05011 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002  Plus one or more of the following, including their prerequisites:  MEM05015	4

Code	Title	Prerequisites	Points
		MEM05017 MEM05019 MEM05047 MEM05055	
MEM05037	Perform geometric development	MEM09002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	6
MEM05038	Perform advanced geometric development - cylindrical/rectangular	MEM05037 MEM09002 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006	2
MEM05039	Perform advanced geometric development - conical	MEM05037 MEM09002 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006	2
MEM05040	Perform advanced geometric development - transitions	MEM05037 MEM09002 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006	4
MEM05041	Weld using flame powder spraying	MEM05004 MEM05051 MEM05052 MEM05055 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015	4

Code	Title	Prerequisites	Points
		MEM14006 MEM16006 MEM18001 MEM18002	
MEM05042	Perform welds to code standards using flux core arc welding process	MEM05007 MEM05026 MEM05047 MEM05048 MEM05051 MEM05052 MEM05056 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM05043	Perform welds to code standards using gas metal arc welding process	MEM05007 MEM05017 MEM05018 MEM05026 MEM05050 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM05044	Perform welds to code standards using gas tungsten arc welding process	MEM05007 MEM05019 MEM05020 MEM05026 MEM05049 MEM05051 MEM05052	6

Code	Title	Prerequisites	Points
		MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	
MEM05045	Perform pipe welds to code standards using manual metal arc welding process	MEM05007 MEM05012 MEM05015 MEM05016 MEM05026 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM05046	Perform welds to code standards using manual metal arc welding process	MEM05007 MEM05012 MEM05015 MEM05016 MEM05026 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM05047	Weld using flux core arc welding process	MEM05051 MEM05052	4

Code	Title	Prerequisites	Points
		MEM05056 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	
MEM05048	Perform advanced welding using flux core arc welding process	MEM05007 MEM05047 MEM05051 MEM05052 MEM05056 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05049	Perform routine gas tungsten arc welding	MEM11011 MEM13015 MEM16006	2
MEM05050	Perform routine gas metal arc welding	MEM11011 MEM13015 MEM16006	2
MEM05051	Select welding processes	MEM13015 MEM16006	2
MEM05052	Apply safe welding practices	MEM13015 MEM16006	4
MEM05053	Set and edit computer controlled thermal cutting machines	MEM05009 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM05054	Write basic NC/CNC programs for thermal cutting machines	MEM05007 MEM05008 MEM05009	4



Code	Title	Prerequisites	Points
		MEM05053 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	
MEM05055	Weld using oxy fuel gas welding process	MEM05004 MEM05051 MEM05052 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM05056	Perform routine flux core arc welding	MEM11011 MEM13015 MEM16006	2
MEM05057	Perform routine submerged arc welding	MEM11011 MEM13015 MEM16006	2
MEM05058	Perform welds to code standards using oxy fuel gas welding process	MEM05004 MEM05007 MEM05022 MEM05026 MEM05051 MEM05052 MEM05055 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	6
MEM06001	Perform hand forging	MEM11011 MEM13015	4

Code	Title	Prerequisites	Points
		MEM16006 MEM18001	
MEM06002	Perform hammer forging	MEM11011 MEM13015 MEM16006	4
MEM06003	Carry out heat treatment	MEM11011 MEM13015 MEM16006	6
MEM06004	Select heat treatment processes and test finished product	MEM06003 MEM11011 MEM13015 MEM16006	6
MEM06005	Perform drop and upset forging	MEM06002 MEM11011 MEM13015 MEM16006	4
MEM06006	Repair springs	MEM06001 MEM06003 MEM11011 MEM13015 MEM16006 MEM18001	4
MEM06007	Perform basic incidental heat/quenching, tempering and annealing	MEM11011 MEM13015 MEM16006	2
MEM06008	Hammer forge complex shapes	MEM06002 MEM11011 MEM13015 MEM16006	4
MEM06009	Hand forge complex shapes	MEM06001 MEM11011 MEM13015 MEM16006	4
MEM07001	Perform operational maintenance of machines/equipment	MEM11011 MEM13015 MEM16006 MEM18001	2
MEM07002	Perform precision shaping/planing/slotting operations	MEM07005 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024	4

Code	Title	Prerequisites	Points
		MEM13015 MEM14006 MEM16006 MEM18001	
MEM07003	Perform routine machine setting	MEM07024 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM07004	Perform complex machine setting	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following, including their prerequisites:  MEM07006 MEM07007 MEM07008 MEM07013 MEM07025 MEM07026 MEM07027 MEM07041	8
MEM07005	Perform general machining	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	8
MEM07006	Perform lathe operations	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015	4

Code	Title	Prerequisites	Points
		MEM14006 MEM16006 MEM18001	
MEM07007	Perform milling operations	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07008	Perform grinding operations	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07009	Perform precision jig boring operations	MEM07005 MEM07007 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07010	Perform tool and cutter grinding operations	MEM07005 MEM07008 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4

Code	Title	Prerequisites	Points
MEM07011	Perform complex milling operations	MEM07005 MEM07007 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07012	Perform complex grinding operations	MEM07005 MEM07008 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07013	Perform machining operations using horizontal and vertical boring machines	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07014	Perform electro-discharge machining (EDM) operations	MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07015	Set computer controlled machines and processes	MEM09002 MEM11011 MEM12023	2

Code	Title	Prerequisites	Points
		MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of following, including their prerequisites:  MEM07005 MEM07028	
MEM07016	Set and edit computer controlled machines and processes	MEM07015 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following, including their prerequisites:  MEM07005 MEM07028	4
MEM07018	Write basic NC and CNC programs	MEM07015 MEM07016 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following, including their prerequisites:  MEM07005 MEM07028	4
MEM07019	Program NC and CNC machining centre	MEM07015 MEM07016 MEM07018	2

Code	Title	Prerequisites	Points
		MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following including their prerequisites:  MEM07005 MEM07028	
MEM07020	Program multiple spindle and multiple axis NC and CNC machining centre	MEM07015 MEM07016 MEM07018 MEM07019 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following including their prerequisites:  MEM07005 MEM07028	2
MEM07021	Perform complex lathe operations	MEM07005 MEM07006 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4
MEM07022	Program CNC wire cut machines	MEM07015	2



Code	Title	Prerequisites	Points
		MEM07016 MEM07018 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following including their prerequisites:  MEM07005 MEM07028	
MEM07023	Program and set up CNC manufacturing cell	MEM07015 MEM07016 MEM07018 MEM07019 MEM07020 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001  Plus one or more of the following including their prerequisites:  MEM07005 MEM07028	6
MEM07024	Operate and monitor machine and process	MEM11011 MEM13015 MEM16006	4
MEM07025	Perform advanced machine and process operation	MEM07024 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006	6

Code	Title	Prerequisites	Points
		MEM18001	
MEM07026	Perform advanced plastic processing	MEM07024 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	6
MEM07027	Perform advanced press operations	MEM07024 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	6
MEM07028	Operate computer controlled machines and processes	MEM07024 MEM11011 MEM13015 MEM16006	2
MEM07029	Perform routine sharpening and maintenance of production tools and cutters	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM07030	Perform basic metal spinning lathe operations	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	8
MEM07031	Perform complex metal spinning lathe operations	MEM07030 MEM07032 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM07032	Use workshop machines for basic operations	MEM11011 MEM13015 MEM16006	2

Code	Title	Prerequisites	Points
		MEM18001	
MEM07033	Operate and monitor basic boiler	MEM11011 MEM13015 MEM16006	6
MEM07039	Write programs for industrial robots	MEM09002 MEM10004 MEM12023 MEM13015 MEM16006 MEM16008	4
MEM07040	Set multistage integrated processes	MEM09002 MEM11011 MEM12023 MEM13015 MEM14006 MEM16006 MEM16008 MEM18001	6
MEM07041	Perform production machining	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	8
MEM07042	Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems	MEM07001 MEM07003 MEM07004 MEM07024 MEM07025 MEM07032 MEM07043 MEM07044 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM16006 MEM18001 MEM18002 MEM18003 MEM18055	4
MEM07043	Identify causes of faulty aluminium extrusions	MEM09002	6

Code	Title	Prerequisites	Points
		MEM11011 MEM12023 MEM12024 MEM13015 MEM16006 MEM18001	
MEM07044	Test a new aluminium extrusion die	MEM07043 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM08001	Perform wire, jig and barrel load/unload work	MEM11011 MEM13015 MEM16006	4
MEM08002	Pre-treat work for subsequent surface coating	MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08003	Perform electroplating operations	MEM07001 MEM08001 MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	6
MEM08004	Finish work using wet, dry and vapour deposition methods	MEM08002 MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08005	Prepare and produce specialised coatings	MEM08002 MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08006	Produce clear and/or coloured and/or sealed anodised films on aluminium	MEM08002 MEM11011 MEM13015 MEM16006	2

Code	Title	Prerequisites	Points
MEM08007	Control surface finish production and finished product quality	MEM11011 MEM13015 MEM16006	4
MEM08008	Operate and control surface finishing waste treatment process	MEM11011 MEM13003 MEM13015 MEM16006	3
MEM08009	Make up solutions	MEM11011 MEM13003 MEM13015 MEM16006	2
MEM08010	Manually finish/polish materials	MEM11011 MEM13015 MEM16006 MEM18001	6
MEM08011	Prepare surfaces using solvents and/or mechanical means	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	2
MEM08012	Prepare surfaces by abrasive blasting (basic)	MEM08016 MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08013	Prepare surfaces by abrasive blasting (advanced)	MEM08012 MEM08016 MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08014	Apply protective coatings (basic)	MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08015	Apply protective coatings (advanced)	MEM08014 MEM11011 MEM13003 MEM13015 MEM16006	4
MEM08016	Control blast coating by-products, materials and emissions	MEM11011 MEM13003	1

Code	Title	Prerequisites	Points
		MEM13015 MEM16006	
MEM08018	Electroplate engineering coatings	MEM07001 MEM08001 MEM08003 MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	6
MEM08019	Electroplate protective finishes	MEM07001 MEM08001 MEM08003 MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	6
MEM08020	Electroplate decorative finishes	MEM07001 MEM08001 MEM08003 MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	6
MEM09002	Interpret technical drawing	MEM12023 MEM12024 MEM13015 MEM16006	4
MEM09003	Prepare basic engineering drawing	MEM09002 MEM12023 MEM12024 MEM13015 MEM16006	8
MEM09004	Perform electrical or electronic detail drafting	MEM09002 MEM09003 MEM12023 MEM12024 MEM13015 MEM16006	8
MEM09005	Perform basic engineering detail drafting	MEM09002 MEM09003	8

Code	Title	Prerequisites	Points
		MEM12023 MEM12024 MEM13015 MEM16006	
MEM09006	Perform advanced engineering detail drafting	MEM09002 MEM09003 MEM09005 MEM12023 MEM12024 MEM13015 MEM16006	4
MEM09007	Perform advanced mechanical detail drafting	MEM09002 MEM09003 MEM09005 MEM09006 MEM12023 MEM12024 MEM13015 MEM16006	4
MEM09008	Perform advanced structural detail drafting	MEM09002 MEM12023 MEM12024 MEM13015 MEM16006	4
MEM09009	Create 2-D drawings using computer-aided design system	MEM09002 MEM12023 MEM12024 MEM13015 MEM16006 MEM16008	8
MEM09010	Create 3-D models using computer-aided design system	MEM09002 MEM09009 MEM12023 MEM12024 MEM13015 MEM16006 MEM16008	4
MEM09011	Apply basic engineering design concepts	MEM09002 MEM12023 MEM12024 MEM13015 MEM16006	6
MEM09021	Interpret and produce drawings of curved 3-D shapes	MEM12023	4



Code	Title	Prerequisites	Points
		MEM12024 MEM13015 MEM16006	
MEM09022	Create 2-D code files using computer-aided manufacturing system	MEM09002 MEM12023 MEM12024 MEM13015 MEM16006 MEM16008	4
MEM09023	Create 3-D code files using computer-aided manufacturing system	MEM09002 MEM09022 MEM12023 MEM12024 MEM13015 MEM16006 MEM16008	6
MEM10001	Erect structures	MEM05007 MEM05051 MEM05052 MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002  Plus one or both of the following, including their prerequisites:  MEM05015 MEM05017	4
MEM10002	Terminate and connect electrical wiring	MEM09002 MEM12002 MEM13015 MEM16006 MEM18001	3
MEM10003	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	MEM09002 MEM10002 MEM12002 MEM12023	12

Code	Title	Prerequisites	Points
		MEM18001 MEM18002 MEM18049	
MEM10004	Enter and change programmable controller operational parameters	MEM09002 MEM13015 MEM16006 MEM16008	2
MEM10005	Commission programmable controller programs	MEM09002 MEM10004 MEM13015 MEM16006 MEM16008	4
MEM10006	Install machine/plant	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18009 MEM18055	4
MEM10007	Modify control systems	Path 1 MEM09002 MEM11011 MEM12002 MEM12003 MEM12023 MEM12024 MEM12025 MEM13015 MEM14006 MEM16006 MEM16010 MEM18001 MEM18002 MEM18003 MEM18006 MEM18018 MEM18019	6

Code	Title	Prerequisites	Points
		MEM18020 MEM18021 MEM18022 MEM18023 MEM18053 MEM18055 Path 2 MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18057 MEM18060 MEM18062 MEM18067 Path 3 MEM05001 MEM05002 MEM09002 MEM11011 MEM12004 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18056 MEM18057 MEM18058 MEM18059 MEM18065 Path 4	

Code	Title	Prerequisites	Points
		MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086 MEM18088 MEM18092 Path 5 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086 MEM18090 MEM18092 Path 6 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086 MEM18089	

Code	Title	Prerequisites	Points
		MEM18090 MEM18093 Path 7 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18060 MEM18062 MEM18064 MEM18067	
MEM10008	Undertake commissioning procedures for plant and/or equipment	Path 1 MEM09002 MEM10006 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18009 MEM18055 Path 2 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	4

Code	Title	Prerequisites	Points
		MEM18001 MEM18002 MEM18055 MEM18086 MEM18090 Path 3 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18089	
MEM10009	Install refrigeration and air conditioning plant and equipment	MEM05006 MEM09002 MEM10010 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086	4
MEM10010	Install pipework and pipework assemblies	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM10011	Terminate and connect specialist cables	MEM09002 MEM10002 MEM11011 MEM12002 MEM13015 MEM16006 MEM18001	3

Code	Title	Prerequisites	Points
MEM10013	Install split air conditioning systems and associated pipework	MEM05006 MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	6
MEM11001	Erect/dismantle scaffolding and equipment	MEM11011 MEM13015 MEM16006 MEM18001	4
MEM11002	Erect/dismantle intermediate scaffolding and equipment	MEM11001 MEM11011 MEM13015 MEM16006 MEM18001	4
MEM11003	Coordinate erection/dismantling of complex scaffolding/equipment	MEM11001 MEM11002 MEM11011 MEM13015 MEM16006 MEM18001	4
MEM11004	Undertake dogging	MEM11011 MEM13015 MEM16006 MEM18001	4
MEM11005	Pick and process order	MEM11011 MEM13015 MEM16006	4
MEM11006	Perform production packaging	MEM11011 MEM13015 MEM16006	2
MEM11007	Administer inventory procedures	MEM13015 MEM16006	4
MEM11008	Package materials (stores and warehouse)	MEM11011 MEM13015 MEM16006	2
MEM11009	Handle/move bulk fluids/gases	MEM11011 MEM13015 MEM16006	4
MEM11010	Operate mobile load shifting equipment	MEM11011	4

Code	Title	Prerequisites	Points
		MEM13015 MEM16006	
MEM11011	Undertake manual handling	MEM13015 MEM16006	2
MEM11012	Purchase materials	MEM11011 MEM13015 MEM16006	6
MEM11013	Undertake warehouse receipt process	MEM11011 MEM13015 MEM16006	4
MEM11014	Undertake warehouse dispatch process	MEM11008 MEM11011 MEM13015 MEM16006	4
MEM11015	Manage warehouse inventory system	MEM11007 MEM13015 MEM16006	6
MEM11016	Order materials	MEM13015 MEM16006	2
MEM11017	Organise and lead stocktakes	MEM11007 MEM11011 MEM13015 MEM16006	4
MEM11018	Organise and maintain warehouse stock receipt and dispatch system	MEM11008 MEM11011 MEM13015 MEM16006  Plus one of the following, including their prerequisites:  MEM11013 MEM11014	6
MEM11019	Undertake tool store procedures	MEM11007 MEM11011 MEM11013 MEM12024 MEM13015 MEM16006	4
MEM11020	Perform advanced warehouse computer operations	MEM13015 MEM16006 MEM16008	4
MEM11021		MEM11010	2



Code	Title	Prerequisites	Points
	Perform advanced operation of load shifting equipment	MEM11011 MEM13015 MEM16006	
MEM11022	Operate fixed/moveable load shifting equipment	MEM11011 MEM13015 MEM16006	4
MEM11023	Operate a bridge and gantry crane	MEM11011 MEM13015 MEM16006	4
MEM11024	Undertake basic rigging	MEM11004 MEM11011 MEM13015 MEM16006	4
MEM11025	Operate a non-slewing mobile crane of greater than three tonnes capacity	MEM11011 MEM13015 MEM16006	4
MEM12001	Use comparison and basic measuring devices	MEM11011 MEM13015 MEM16006	2
MEM12002	Perform electrical/electronic measurement	MEM11011 MEM13015 MEM16006	2
MEM12003	Perform precision mechanical measurement	MEM11011 MEM12023 MEM13015 MEM16006	2
MEM12004	Perform precision electrical/electronic measurement	MEM11011 MEM12023 MEM13015 MEM16006	4
MEM12005	Calibrate measuring equipment	Path 1 MEM11011 MEM12003 MEM12023 MEM13015 MEM16006 Path 2 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006	6
MEM12006	Mark off/out (general engineering)	MEM09002	4

Code	Title	Prerequisites	Points
		MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	
MEM12007	Mark off/out structural fabrications and shapes	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	4
MEM12019	Measure components using coordinate measuring machines	MEM13015 MEM16006	4
MEM12020	Set and operate coordinate measuring machines	MEM13015 MEM16006	2
MEM12021	Program coordinate measuring machines	MEM09002 MEM12003 MEM12023 MEM13015 MEM16006	4
MEM12022	Program coordinate measuring machines (advanced)	MEM09002 MEM12003 MEM12023 MEM13015 MEM16006	2
MEM12023	Perform engineering measurements	MEM13015 MEM16006	5
MEM12024	Perform computations	MEM13015 MEM16006	3
MEM12025	Use graphical techniques and perform simple statistical computations	MEM12024 MEM13015 MEM16006	2
MEM12026	Perform advanced trade calculations in a manufacturing, engineering or related environment	MEM12024 MEM13015 MEM16006	4
MEM13001	Perform emergency first aid	MEM11011 MEM13015 MEM16006	1
MEM13002	Undertake work health and safety activities in the workplace	MEM11011 MEM13015	3

Code	Title	Prerequisites	Points
		MEM16006	
MEM13003	Work safely with industrial chemicals and materials	MEM11011 MEM13015 MEM16006	2
MEM13004	Work safely with molten metals/glass	MEM11011 MEM13015 MEM16006	2
MEM13006	Collect and evaluate work health and safety data for an enterprise or section of an enterprise	MEM11011 MEM13015 MEM16006	4
MEM13007	Maintain water treatment systems for cooling towers	MEM11011 MEM13015 MEM16006 MEM18001	2
MEM13010	Supervise work health and safety in an industrial work environment.	MEM11011 MEM13002 MEM13015 MEM16006	4
MEM13013	Work safely with ionizing radiation	MEM11011 MEM13015 MEM16006	4
MEM13015	Work safely and effectively in manufacturing and engineering	Nil	2
MEM14001	Schedule material deliveries	MEM13015 MEM16006	8
MEM14002	Undertake basic process planning	MEM13015 MEM16006	8
MEM14003	Undertake production scheduling	MEM13015 MEM16006	8
MEM14006	Plan work activities	MEM13015 MEM16006	4
MEM15001	Perform basic statistical quality control	MEM12024 MEM13015 MEM16006	2
MEM15003	Use improvement processes in team activities	MEM13015 MEM16006	4
MEM15004	Perform inspection	MEM11011 MEM13015 MEM16006	2
MEM15005	Select and control inspection processes and procedures	MEM11011 MEM13015 MEM15004 MEM16006	4

Code	Title	Prerequisites	Points
MEM15007	Conduct product and/or process capability studies	MEM12024 MEM12025 MEM13015 MEM15001 MEM15008 MEM16006	6
MEM15008	Perform advanced statistical quality control	MEM12024 MEM12025 MEM13015 MEM15001 MEM16006	2
MEM15010	Perform laboratory procedures	MEM11011 MEM13015 MEM16006	8
MEM15011	Exercise external quality assurance	MEM11011 MEM13015 MEM15004 MEM15005 MEM16006	6
MEM15012	Maintain/supervise the application of quality procedures	MEM12024 MEM12025 MEM13015 MEM15001 MEM16006	4
MEM16001	Give formal presentations and take part in meetings	MEM13015 MEM16006	2
MEM16002	Conduct formal interviews and negotiations	MEM13015 MEM16006	4
MEM16003	Provide advanced customer service	MEM13015 MEM16006	2
MEM16004	Perform internal/external customer service	MEM13015 MEM16006	2
MEM16005	Operate as a team member to conduct manufacturing, engineering or related activities	MEM11011 MEM13015 MEM16006	2
MEM16006	Organise and communicate information	MEM13015	2
MEM16008	Interact with computing technology	MEM13015 MEM16006	2
MEM16009	Research and analyse engineering information	MEM13015 MEM16006 MEM16012	2
MEM16010	Write reports	MEM14006	2

Code	Title	Prerequisites	Points
		MEM13015 MEM16006	
MEM16011	Communicate with individuals and small groups	MEM13015 MEM16006	2
MEM16012	Interpret technical specifications and manuals	MEM13015 MEM16006	4
MEM16013	Operate in a self-directed team	MEM13015 MEM16006	2
MEM16014	Report technical information	MEM13015 MEM16006	2
MEM17001	Assist in development and deliver training in the workplace	MEM13015 MEM16006	2
MEM17002	Conduct workplace assessment	MEM11011 MEM13015 MEM16006	2
MEM17003	Assist in the provision of on-the-job training	MEM13015 MEM16006	2
MEM18001	Use hand tools	MEM11011 MEM13015 MEM16006	2
MEM18002	Use power tools/hand held operations	MEM11011 MEM13015 MEM16006	2
MEM18003	Use tools for precision work	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM18004	Maintain and overhaul mechanical equipment	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18005 MEM18006 MEM18007 MEM18009	4

Code	Title	Prerequisites	Points
		MEM18011 MEM18055	
MEM18005	Perform fault diagnosis, installation and removal of bearings	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEMM18006	Perform precision fitting of engineering components	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18055	6
MEM18007	Maintain and repair mechanical drives and mechanical transmission assemblies	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEM18008	Balance equipment	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006	2

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	
MEM18009	Perform precision levelling and alignment of machines and engineering components	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEM18010	Perform equipment condition monitoring and recording	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM18011	Shut down and isolate machines/equipment	MEM11011 MEM13015 MEM16006	2
MEM18012	Perform installation and removal of mechanical seals	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	2
MEM18013	Perform gland packing	MEM11011 MEM12023	2

Code	Title	Prerequisites	Points
		MEM13015 MEM16006 MEM18001	
MEM18014	Manufacture press tools and gauges	MEM06007 MEM07005 MEM07006 MEM07007 MEM07008 MEM09002 MEM11011 MEM12003 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18015 MEM18055	8
MEM18015	Maintain tools and dies	MEM06007 MEM07005 MEM07006 MEM07007 MEM07008 MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEM18016		MEM09002	4



Code	Title	Prerequisites	Points
	Analyse plant and equipment condition monitoring results	MEM11011 MEM12003 MEM12023 MEM12024 MEM12025 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	
MEM18017	Modify mechanical systems and equipment	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18005 MEM18006 MEM18007 MEM18009 MEM18011 MEM18055	8
MEM18018	Maintain pneumatic system components	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEM18019	Maintain pneumatic systems	MEM09002 MEM11011	4

Code	Title	Prerequisites	Points
		MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18018 MEM18055	
MEM18020	Maintain hydraulic system components	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	4
MEM18021	Maintain hydraulic systems	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18020 MEM18055	4
MEM18022	Maintain fluid power controls	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006	8

Code	Title	Prerequisites	Points
		MEM18001 MEM18002 MEM18003 MEM18006 MEM18055  Plus one or more of the following, including their prerequisites: MEM18019  MEM18021	
MEM18023	Modify fluid power system operation	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18018 MEM18019 MEM18020 MEM18021 MEM18022 MEM18055	8
MEM18045	Fault find and repair electrical equipment/components up to 250 volts single phase supply	MEM09002 MEM10002 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM18046	Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	MEM09002 MEM10002 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001	10

Code	Title	Prerequisites	Points
		MEM18002 MEM18055	
MEM18048	Fault find and repair/rectify basic electrical circuits	MEM09002 MEM11011 MEM10002 MEM10003 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18049	12
MEM18049	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	MEM09002 MEM10002 MEM12002 MEM13015 MEM16006 MEM18001	3
MEM18050	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	MEM09002 MEM10002 MEM12002 MEM13015 MEM16006 MEM18001	3
MEM18051	Fault find and repair/rectify complex electrical circuits	MEM09002 MEM11011 MEM10002 MEM10003 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18048 MEM18049	6
MEM18053	Modify fluid power control systems	MEM09002 MEM11011	6

Code	Title	Prerequisites	Points
		MEM12023 MEM12024 MEM12025 MEM13015 MEM14006 MEM16006 MEM16010 MEM18001 MEM18002 MEM18003 MEM18006 MEM18018 MEM18019 MEM18020 MEM18021 MEM18022 MEM18023 MEM18055	
MEM18054	Fault find, test and calibrate instrumentation systems and equipment	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055  Plus one or more of the following, including their prerequisites:  MEM18057 MEM18064	8
MEM18055	Dismantle, replace and assemble engineering components	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	3
MEM18056	Diagnose and repair analog equipment and components	MEM05001 MEM09002 MEM11011 MEM12004 MEM13015	10

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18057	
MEM18057	Maintain/service analog/digital electronic equipment	MEM05001 MEM09002 MEM11011 MEM12004 MEM13015 MEM16006 MEM18001	6
MEM18058	Modify electronic equipment	MEM05001 MEM09002 MEM11011 MEM12004 MEM13015 MEM16006 MEM18001 MEM18002 MEM18056 MEM18057 MEM18065	4
MEM18059	Modify electronic systems	MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18056 MEM18057 MEM18058 MEM18065	4
MEM18060	Maintain, repair control instrumentation - single and multiple loop control systems	MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	8

Code	Title	Prerequisites	Points
		MEM18054 MEM18055 MEM18062  Plus one or more of the following, including their prerequisites:  MEM18057 MEM18064	
MEM18061	Maintain/calibrate complex control systems	Path 1: MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18057 MEM18062 MEM18069  Path 2: MEM09002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18064 MEM18069  Path 3: MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015	8

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18057 MEM18060 MEM18062 MEM18067 Path 4: MEM09002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18060 MEM18062 MEM18064 MEM18067	
MEM18062	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	Path 1: MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18057 Path 2: MEM09002 MEM11011 MEM12002 MEM12023 MEM13015	8



Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002 MEM18054 MEM18055 MEM18064	
MEM18063	Terminate signal and data cables	MEM05001 MEM09002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM18064	Maintain instrumentation system components	MEM09002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	6
MEM18065	Diagnose and repair digital equipment and components	MEM05001 MEM09002 MEM11011 MEM12004 MEM13015 MEM16006 MEM18001 MEM18057	10
MEM18066	Diagnose and repair microprocessor-based equipment	MEM05001 MEM09002 MEM11011 MEM12004 MEM12023 MEM13015 MEM16006 MEM18001 MEM18057 MEM18065	6
MEM18067	Tune control loops - multi controller or multi element systems	MEM09002 MEM11011	6

Code	Title	Prerequisites	Points
		MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055  Plus one or more of the following, including their prerequisites:  MEM18062 MEM18064	
MEM18069	Maintain, repair instrumentation process control analysers	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18054 MEM18055  Plus one or more of the following including their prerequisites:  MEM18062 MEM18064	6
MEM18071	Connect and disconnect fluid conveying system components	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	2
MEM18072	Manufacture fluid conveying conductor assemblies	MEM05006 MEM11011 MEM13015 MEM16006 MEM18001	4
MEM18083	Handle fluorocarbon refrigerants according to regulations	MEM13015 MEM16006	1
MEM18084	Commission and decommission split air conditioning systems	MEM09002 MEM11011 MEM12023 MEM12024	4

Code	Title	Prerequisites	Points
		MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	
MEM18085	Install, service and repair domestic air conditioning and refrigeration appliances	MEM05006 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	6
MEM18086	Test, recover, evacuate and charge refrigeration systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM18087	Service and repair domestic and light commercial refrigeration and air conditioning equipment	MEM05006 MEM09002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086	6
MEM18088	Maintain and repair commercial air conditioning systems and components	MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4

Code	Title	Prerequisites	Points
		MEM18002 MEM18055 MEM18086	
MEM18089	Maintain and repair central air handling systems	MEM09002 MEM10002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18049 MEM18055 MEM18086	6
MEM18090	Maintain and repair industrial refrigeration systems and components	MEM05006 MEM09002 MEM10002 MEM10010 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18049 MEM18055 MEM18086	6
MEM18091	Maintain and repair multistage, cascade and/or ultra-cold industrial refrigeration systems	MEM09002 MEM10002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	4

Code	Title	Prerequisites	Points
		MEM18002 MEM18049 MEM18055 MEM18086  Plus one or more of the following including prerequisites:  MEM18088 MEM18090	
MEM18092	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086  Plus one or more of the following including prerequisites:  MEM18088 MEM18090	6
MEM18093	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	MEM09002 MEM10002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18049 MEM18055 MEM18086	8

Code	Title	Prerequisites	Points
		Plus one or more of the following including prerequisites:  MEM18090 MEM18089	
MEM18094	Service and repair commercial refrigeration	MEM09002 MEM10002 MEM11011 MEM12002 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18049 MEM18055 MEM18086	6
MEM18095	Maintain and repair cooling towers/evaporative condensers and associated equipment	MEM05006 MEM09002 MEM11011 MEM12002 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055 MEM18086  Plus one or more of the following including prerequisites:  MEM18088 MEM18094	4
MEM18096	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	MEM05006 MEM10010 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006	6

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002 MEM18055 MEM18086	
MEM18097	Manufacture cavity dies	MEM06007 MEM07005 MEM07006 MEM07007 MEM07008 MEM09002 MEM11011 MEM12003 MEM12006 MEM12023 MEM12024 MEM12026 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18015 MEM18055	8
MEM18098	Prepare to perform work associated with fuel system installation and servicing	MEM09002 MEM11011 MEM13015 MEM16006	2
MEM19001	Perform jewellery metal casting	MEM13004 MEM13015 MEM16006	6
MEM19002	Prepare jewellery illustrations	MEM13015 MEM16006	4
MEM19003	Handle gem materials	MEM13015 MEM16006	2
MEM19004	Handle and examine gemstone materials	MEM13015 MEM16006 MEM19003	6
MEM19005	Produce three-dimensional precision items	MEM11011 MEM13003 MEM13004	8

Code	Title	Prerequisites	Points
		MEM13015 MEM16006 MEM18001 MEM18002 MEM18003	
MEM19006	Replace watch batteries	MEM11011 MEM13015 MEM16006 MEM18001	1
MEM19007	Perform gemstone setting	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18003 MEM19003	6
MEM19008	Prepare jewellery designs	MEM11011 MEM13015 MEM16006	6
MEM19009	Perform investment procedures for lost wax casting process	MEM11011 MEM12024 MEM13015 MEM16006 MEM18001  Plus one or more of the following including their prerequisites:  MEM07024 MEM13003	1
MEM19010	Produce rubber moulds for lost wax casting process	MEM13015 MEM16006	2
MEM19011	Perform wax injection of moulds for lost wax casting process	MEM13015 MEM16006	2
MEM19012	Produce jewellery wax model	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002 MEM18003	4
MEM19013	Produce jewellery metal masters	MEM08010 MEM13004	4



Code	Title	Prerequisites	Points
		MEM13015 MEM16006 MEM19001	
MEM19014	Perform hand engraving	MEM11011 MEM13015 MEM16006 MEM18001	4
MEM19015	Perform jewellery enamelling	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001	4
MEM19016	Construct jewellery components	MEM05006 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM19017	Fabricate jewellery items	MEM05006 MEM06007 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	6
MEM19018	Repair jewellery items	MEM05006 MEM11011 MEM12023 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002 MEM19001 MEM19003 MEM19016 MEM19017	6
MEM19020	Fault find and maintain micro-mechanisms	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4

Code	Title	Prerequisites	Points
		MEM18002 MEM18055	
MEM19021	Diagnose and service micro-mechanisms	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM19020	6
MEM19022	Perform precision micro-mechanism diagnosis and servicing	MEM07005 MEM09002 MEM11011 MEM12003 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18003 MEM18055 MEM19020 MEM19021	6
MEM20001	Produce keys	MEM13015 MEM16006 MEM18001	4
MEM20002	Assemble and test lock mechanisms	MEM13015 MEM16006 MEM18001 MEM20001	6
MEM20003	Install and upgrade locks and hardware	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM20004	Gain entry	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002 MEM20001 MEM20002	4

Code	Title	Prerequisites	Points
		MEM20003	
MEM20005	Install and maintain door control devices/systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	2
MEM20006	Maintain and service mechanical locking devices	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	6
MEM20007	Plan and prepare a masterkey system	MEM12024 MEM13015 MEM16006 MEM18001 MEM20001 MEM20002	4
MEM20008	Develop and implement a masterkey system	MEM12024 MEM13015 MEM16006 MEM18001 MEM20001 MEM20002 MEM20007	6
MEM20009	Gain entry and reinstate fire and security containers	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002 MEM20001 MEM20004	4
MEM20010	Gain entry and reinstate automotive locking systems	MEM13015 MEM16006 MEM18001 MEM20001 MEM20002 MEM20004	4
MEM20011	Service and repair fire and security containers	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002 MEM20001	6

Code	Title	Prerequisites	Points
		MEM20002 MEM20006	
MEM20012	Service and repair mechanical automotive locking systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002 MEM20001 MEM20002 MEM20006	4
MEM20013	Service automotive transponder systems	MEM13015 MEM16006 MEM18001 MEM20001	2
MEM20014	Perform a site security survey	MEM13015 MEM16006	2
MEM21001	Replace watch batteries, capacitors and bands	MEM13015 MEM16006	2
MEM21002	Perform watch movement exchange	MEM13015 MEM16006 MEM21001	2
MEM21003	Perform watch case servicing, repair and refurbishment	MEM13015 MEM16006 MEM21001 MEM21002	4
MEM21004	Clean watch and clock components	MEM13015 MEM16006	2
MEM21005	Diagnose faults in quartz watches	MEM13015 MEM16006 MEM21001	2
MEM21006	Service quartz watches	MEM13015 MEM16006 MEM21001 MEM21002 MEM21005	4
MEM21007	Service complex quartz watches	MEM13015 MEM16006 MEM21001 MEM21002 MEM21005 MEM21006	4
MEM21008	Service mechanical watches	MEM11011 MEM13015	4

Code	Title	Prerequisites	Points
		MEM16006 MEM18001	
MEM21009	Inspect, diagnose, adjust and repair mechanical watches	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008	4
MEM21010	Service watch power generating systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009	2
MEM21011	Service calendar and other dial indication mechanisms for watches	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009 MEM21010	4
MEM21012	Service and repair mechanical watch oscillating systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009	4
MEM21013	Service, test and adjust watch escapements	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009 MEM21012	4
MEM21014	Service mechanical chronograph watches	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009 MEM21010 MEM21011	6
MEM21015	Perform precision watch timing and adjustment	MEM11011 MEM13015	6

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM21008 MEM21009 MEM21012 MEM21013	
MEM21016	Install and set up clocks	MEM13015 MEM16006	2
MEM21017	Service and repair clock timepieces	MEM13015 MEM16006	6
MEM21018	Service clock escapements and oscillating systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM21008 MEM21009 MEM21012 MEM21013 MEM21017	4
MEM21019	Service and repair clock striking mechanisms	MEM13015 MEM16006 MEM21017	4
MEM21020	Service and repair clock chiming mechanisms	MEM13015 MEM16006 MEM21017 MEM21019	6
MEM21021	Restore clockwork mechanisms	MEM06007 MEM09002 MEM11011 MEM13015 MEM16006 MEM18001 MEM21017 MEM21019 MEM21020	6
MEM21022	Manufacture watch and clock components	MEM06007 MEM07005 MEM09002 MEM11011 MEM12023 MEM12024 MEM13015 MEM14006	6

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM21017 MEM21019 MEM21020 MEM21021	
MEM21023	Plan, set up and operate horological workshop or service centre	MEM13015 MEM16006	4
MEM25001	Apply fibre-reinforced materials	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	2
MEM25002	Form and integrate fibre-reinforced structures	MEM09002 MEM11011 MEM12023 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM25003	Set up marine vessel structures	MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	4
MEM25004	Fair and shape surfaces	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	2
MEM25005	Construct and assemble marine vessel timber components	MEM04018 MEM09002 MEM11011 MEM12007 MEM12023	8

Code	Title	Prerequisites	Points
		MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002	
MEM25006	Undertake marine sheathing operations	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002 MEM25001 MEM25004	2
MEM25007	Maintain marine vessel surfaces	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	4
MEM25008	Repair marine vessel surfaces and structures	MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13003 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM25004 MEM25007	4
MEM25009	Form timber shapes using hot processes	MEM04018 MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001	2



Code	Title	Prerequisites	Points
		MEM18002	
MEM25010	Perform fitout procedures	MEM04018 MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM25005	4
MEM25011	Install marine systems	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	8
MEM25012	Install and test operations of marine auxiliary systems	MEM11011 MEM13003 MEM13015 MEM16006 MEM18001 MEM18002	6
MEM25013	Produce three-dimensional plugs/moulds	MEM04018 MEM09002 MEM11011 MEM12007 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM25002 MEM25003	12
MEM25014	Perform marine slipping operations	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	2
MEM25015		MEM09002	2

Code	Title	Prerequisites	Points
	Assemble and install equipment and accessories/ancillaries	MEM11011 MEM13015 MEM16006 MEM18001 MEM18002	
MEM26001	Lay up composites using open moulding techniques	MEM13015 MEM16006	6
MEM26002	Lay up composites using vacuum closed moulding techniques	MEM13015 MEM16006	6
MEM26003	Lay up composites using pressure closed moulding techniques	MEM13015 MEM16006	6
MEM26004	Make basic plugs for composites fabrication	MEM13015 MEM16006	3
MEM26005	Make basic moulds for composites fabrication	MEM13015 MEM16006	3
MEM26006	Mark and cut out sheets for composite use	MEM13015 MEM16006	4
MEM26007	Select and use reinforcing appropriate for product	MEM13015 MEM16006	4
MEM26008	Select and use resin systems appropriate for product	MEM13015 MEM16006	4
MEM26009	Select and use cores and fillers appropriate for product	MEM13015 MEM16006	2
MEM26010	Store and handle composite materials	MEM13015 MEM16006	2
MEM26011	Determine materials and techniques for a composite component or product	MEM09002 MEM13015 MEM16006 MEM26007 MEM26008 MEM26009	6
MEM26012	Record and trial work processes for one-off composite products	MEM13015 MEM16006	4
MEM26013	Select and use composite processes or systems appropriate for product	MEM13015 MEM16006	4
MEM26014	Adjust resin chemicals for current conditions	MEM13015 MEM16006	4
MEM26015	Select and apply repair techniques	MEM13015 MEM16006	6
MEM26016	Select and use joining techniques	MEM13015 MEM16006	6
MEM26017	Prepare composite or other substrate surfaces	MEM13015	4

Code	Title	Prerequisites	Points
		MEM16006	
MEM26018	Organise composite trials	MEM13015 MEM16006	4
MEM26019	Finish a composite product	MEM13015 MEM16006	4
MEM26020	Identify and interpret required standards for composites	MEM13015 MEM16006	2
MEM27001	Maintain and repair stationary and mobile plant engine cooling systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	2
MEM27002	Test and repair compression ignition systems	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001	4
MEM27003	Overhaul engine fuel system components	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	8
MEM27004	Maintain and repair engine lubrication systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	2
MEM27005	Tune diesel engines	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002	4

Code	Title	Prerequisites	Points
		MEM18055 MEM27002	
MEM27006	Diagnose and rectify batteries, low voltage sensors and circuits	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	8
MEM27007	Diagnose and rectify low voltage starting systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27006	2
MEM27008	Maintain induction, exhaust and emission control systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27009	Diagnose and rectify braking systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	6
MEM27010	Diagnose and rectify low voltage charging systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	2

Code	Title	Prerequisites	Points
		MEM27006	
MEM27011	Maintain track type undercarriage on mobile plant	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27012	Maintain mobile plant suspension systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27013	Maintain steering systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27014	Diagnose and rectify automatic transmissions	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	8
MEM27015	Diagnose and rectify drive line and final drives	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27016	Diagnose and maintain electronic controlling systems on mobile and stationary plant	MEM09002 MEM11011	4

Code	Title	Prerequisites	Points
		MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27006 MEM27023	
MEM27017	Maintain, fault find and rectify hydraulic systems for mobile plant	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27018	Test, diagnose and rectify mobile and stationary plant external monitoring and control systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM16008 MEM18001 MEM18002 MEM18055 MEM27006 MEM27016 MEM27023	4
MEM27019	Diagnose, repair and replace diesel engines in stationary and mobile plant	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	5
MEM27020	Apply knowledge of large combustion engine operations to service and maintenance tasks	MEM09002 MEM13015 MEM16006	2
MEM27021	Maintain, fault find and repair stationary plant gas turbine engines	MEM09002 MEM11011 MEM12023 MEM13015	6

Code	Title	Prerequisites	Points
		MEM16006 MEM18001 MEM18002 MEM18055	
MEM27022	Maintain, fault find and repair traction drive mechanics	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27006 MEM27016	4
MEM27023	Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27006	4
MEM27024	Diagnose and rectify mobile plant hydrostatic systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27017	4
MEM27025	Maintain, diagnose and rectify fluid power controls in mobile equipment	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055 MEM27006 MEM27017	6
MEM27026		MEM09002	4

Code	Title	Prerequisites	Points
	Service and repair mobile plant air conditioning systems	MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	
MEM27027	Install or modify mobile plant air conditioning systems	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27028	Diagnose and rectify manual transmissions	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27029	Maintain wheels and tyres	MEM11011 MEM13015 MEM16006 MEM18001	2
MEM27030	Perform engine bottom-end overhaul	MEM09002 MEM11011 MEM12003 MEM12023 MEM12024 MEM13015 MEM14006 MEM16006 MEM18001 MEM18002 MEM18055	4
MEM27031	Perform engine top-end overhaul	MEM09002 MEM11011 MEM12023 MEM12024 MEM13015	8



Code	Title	Prerequisites	Points
		MEM14006 MEM16006 MEM18001 MEM18002 MEM18003 MEM18006 MEM18055	
MEM27032	Service combustion engines	MEM11011 MEM13015 MEM16006 MEM18001	2
MEM27033	Perform advanced equipment testing and diagnostics on mobile plant and equipment	MEM09002 MEM11011 MEM12023 MEM13015 MEM16006 MEM16008 MEM18001 MEM18002 MEM18055 MEM27006 MEM27016	8
MEM50001	Classify recreational boating technologies and features	MEM13015	0
MEM50002	Work safely on marine craft	MEM13015	1
MEM50003	Follow work procedures to maintain the marine environment	MEM13015	1
MEM50004	Maintain quality of environment by following marina codes	MEM13015 MEM16006 MEM50003	1
MEM50005	Refuel vessels	MEM13015 MEM16006 MEM50002 MEM50003	0
MEM50006	Check operational capability of marine craft	MEM13015 MEM16006 MEM50002	0
MEM50007	Check operational capability of sails and sail operating equipment	MEM13015 MEM16006 MEM50002	0
MEM50008	Carry out trip preparation and planning	MEM13015 MEM16006	0
MEM50009		MEM13015	2

Code	Title	Prerequisites	Points
	Safely operate a mechanically powered recreational boat	MEM16006	
MEM50010	Respond to boating emergencies and incidents	MEM13015 MEM16006	0

## MEM Release 2.0 – Imported Units

Imported Unit Code	Imported Unit Title
CPCCLDG3001A	Licence to perform dogging
CPCCLRG3001A	Licence to perform rigging basic level
CPCCLSF2001A	Licence to erect, alter and dismantle scaffolding basic level
CPCCLSF3001A	Licence to erect, alter and dismantle scaffolding intermediate level
CPPFES2027A	Inspect, test and maintain non-gaseous pre-engineered fire-suppression systems
CPPFES3042A	Install and commission pre-engineered fire-suppression systems
CPPSEC2021A	Install security equipment and systems
CPPSEC3036A	Program security equipment and system
CPPSEC3037A	Test installed security equipment and system
CPPSEC3038A	Commission and decommission security equipment and system
CPPSEC3039A	Identify and diagnose electronic security equipment and system fault
CPPSEC3041A	Maintain and service security equipment and system
CPPSEC3047A	Provide estimate and quote on security system
CPPSEC3049A	Modify and repair security equipment and system
MEM15015B	Examine trading practices
MEM15016B	Inspect pre-packed articles
MEM15017B	Use and maintain reference standards
MEM15018B	Investigate consumer complaints
MEM15019B	Conduct a field inspection
MEM15020C	Perform verification/certification or in-service inspection
MEM15021C	Conduct audits of servicing licensees and public weighbridge licensees
MEM15022B	Verify reference standards
MEM24001B	Perform basic penetrant testing
MEM24002B	Perform penetrant testing
MEM24003B	Perform basic magnetic particle testing
MEM24004B	Perform magnetic particle testing
MEM24005B	Perform basic eddy current testing
MEM24006B	Perform eddy current testing
MEM24007B	Perform ultrasonic thickness testing
MEM24008B	Perform ultrasonic testing
MEM24009B	Perform basic radiographic testing
MEM24010B	Perform radiographic testing
MEM24011B	Establish non-destructive tests
MEM24012C	Apply metallurgy principles
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment
MEM30025A	Analyse a simple electrical system circuit
MSATCM304A	Interpret basic binary phase diagrams
MSMENV272	Participate in environmentally sustainable work practices
MSMENV472	Implement and monitor environmentally sustainable work practices

PMBPROD291	Operate resin infusion moulding equipment
PMBPROD294	Operate resin transfer moulding equipment
PMBPROD298	Operate equipment using pre-preg material
PMBPROD391	Produce composites using resin infusion
PMBPROD394	Produce composites using resin transfer moulding
PMBPROD398	Produce composites using pre-pregs
TLILIC0002	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)
TLILIC0003	Licence to operate a forklift truck
TLILIC0004	Licence to operate an order picking forklift truck
TLILIC0006	Licence to operate a bridge and gantry crane
TLILIC0008	Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits

## Summary mapping information

### Mapping of MEM R2 to MEM05 Metal and Engineering Training Package

It should be noted that Release 2.0 of the MEM Manufacturing and Engineering Training Package does not completely supersede the MEM05 Metal and Engineering Training Package.

Detailed mapping and equivalence tables are provided at **Appendix 1: Mapping – MEM Release 2.0 to MEM05**.

### Mapping information for MEM R1

**Refer to Appendix 2** for mapping information for MEM31215 Certification III in Engineering – Industrial Electrician.

# Overview of components in the MEM Training Package - Release 2.0

## Introduction

The MEM Manufacturing and Engineering Training Package Release 2.0 includes qualifications for a range of sectors of the metal, engineering, manufacturing engineering and associated industries, including:

- Engineering/manufacturing (1 qualification)
- Production (2 qualifications)
- Engineering (10 qualifications)
- Jewellery (1 qualification)
- Marine Craft Construction (1 qualification)
- Locksmithing (1 qualification)
- Boating (1 qualification)
- Watch and Clock Service and Repair (1 qualification).

Qualifications range from Certificate I in Engineering through to Diploma of Engineering – Advanced Trade.

## Engineering/manufacturing

### *MEM10119 Certificate I in Engineering*

This qualification is designed an entry-level qualification to assist prospective workers entering employment as engineering/manufacturing employees in metal, engineering, manufacturing and associated industries.

## Production

### *MEM20219 Certificate II in Engineering – Production Technology*

### *MEM30119 Certificate III in Engineering – Production Systems*

These qualifications are designed for engineering/manufacturing employees in metal, engineering, manufacturing and associated industries employed in a wide range of workplaces where production personnel are employed, including manufacturing plants, factories, foundries, distribution and warehousing sites and the like. Job roles could be in the fields of production, machine processing, casting and moulding, surface finishing, stores, distribution and warehousing.

These qualifications can also be delivered through a traineeship pathway under an Australian Apprenticeship.

## Engineering

### *MEM30219 Certificate III in Engineering – Mechanical Trade*

This qualification provides trade-level competencies for an engineering tradesperson – mechanical. Mechanical tradespersons are employed in a wide variety of industry sectors, including workshops, jobbing environments, maintenance and the like. Job roles can include working as fitters, machinists, fitter/machinists and as maintenance mechanics.

### *MEM30319 Certificate III in Engineering – Fabrication Trade*

This qualification provides trade level competencies for an engineering tradesperson – fabrication. Fabrication tradespersons are employed in production and jobbing environments, light and heavy fabrication workshops and the like. Job roles can include working as boilermakers, welders, boilermaker/welders, sheetmetal workers, surface finishers and blacksmiths.

#### *MEM31119 Certificate III in Engineering – Composites Trade*

This qualification provides trade-level competencies for a composites tradesperson. Composite tradespersons can be employed in manufacturing, workshops, repair facilities, marine environments, defence or government facilities, including aerospace.

#### *MEM31219 Certificate III in Engineering – Industrial Electrician*

This qualification provides competencies in the ability to select, set up and install, test, fault-find, repair and maintain electrical systems and equipment in buildings and industrial environments, including oil/gas installations, mine sites, processing plants and the like. The qualification covers the Essential Performance Capabilities as required by electrical regulators and includes a capstone assessment.

#### *MEM31319 Certificate III in Refrigeration and Air Conditioning*

This qualification provides trade-level competencies for a heating, ventilation, air conditioning and refrigeration (HVAC/R) tradesperson. Refrigeration and air conditioning mechanics can be employed in industrial, domestic and commercial environments, workshops, as well as maintenance environments. Previously covered by completing qualification MEM30205 Certificate III in Engineering – Mechanical Trade with the specialisation of Refrigeration and Air Conditioning.

#### *MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic*

This qualification provides trade level competencies for an engineering tradesperson – mechanical specialising in diesel fitting and plant mechanics. Diesel fitters can be employed in heavy vehicle and earthmoving workshops, mines, maintenance environments and the like. Previously covered by completing qualification MEM30205 Certificate III in Engineering – Mechanical Trade with the specialisation of Fixed and Mobile Plant Mechanic.

#### *MEM31519 Certificate III in Engineering – Toolmaking Trade*

This qualification provides trade-level competencies for an engineering tradesperson – mechanical specialising in toolmaking. Toolmakers can be employed in manufacturing, workshops, maintenance and the like where they can specialise as die casters, die sinkers, jig makers (metal), plastic mould makers and press tool makers. Previously covered by completing qualification MEM30205 Certificate III in Engineering – Mechanical Trade with the specialisation of Toolmaking.

#### *MEM31719 Certificate III in Engineering – Casting and Moulding*

This qualification provides trade-level competencies for an engineering tradesperson – fabrication specialising in casting and moulding. Casting and moulding tradespersons are employed primarily in foundries. Previously covered by completing qualification MEM30305 Certificate III in Engineering – Fabrication Trade with the specialisation of Casting and Moulding.

#### *MEM40119 Certificate IV in Engineering*

This qualification provides the competencies required by a higher engineering tradesperson carrying out a wide range of engineering work. Engineering tradespersons who have completed the qualification can be employed as advanced mechanical maintenance tradespersons, pressure welders, advanced fabrication structural tradespersons, fluid power systems tradespersons, instrumentation tradespersons, computer-aided manufacturing (CAM) programmers and advanced toolmaking tradespersons.

#### *MEM50119 Diploma of Engineering – Advanced Trade*

This qualification provides the competencies required by an advanced engineering tradesperson - Level II within the metal, engineering, manufacturing and associated industries or at equivalent levels in other industries where engineering tradespersons work. Advanced engineering tradespersons who have completed the qualification can be employed as welding inspectors, welding supervisors, instrumentation and control tradespersons, advanced engineering mechanical tradespersons and mechatronics tradespersons.

## **Jewellery**

### *MEM30619 Certificate III in Jewellery Manufacture*

This qualification provides trade-level competencies for a jewellery manufacture tradesperson. Jewellery manufacture tradespersons can be employed in small, medium and large manufacturing firms.

## **Marine Craft Construction**

### *MEM30719 Certificate III in Marine Craft Construction*

This qualification provides trade-level competencies for a marine craft construction tradesperson. Marine craft construction tradespersons are employed in a wide variety of industry sectors, including workshops, jobbing environments, maintenance and the like. Job roles can include manufacture and repair of boats and marine craft in fibre-reinforced plastics, timber and metal and marine/boat yard operations, fitting out of internal and external components of vessels and installation of engineering drive systems.

## **Locksmithing**

### *MEM30819 Certificate III in Locksmithing*

This qualification provides trade-level competencies for a locksmithing tradesperson. Locksmiths are employed in domestic, automotive and industrial sectors.

## **Boating**

### *MEM30919 Certificate III in Boating Services*

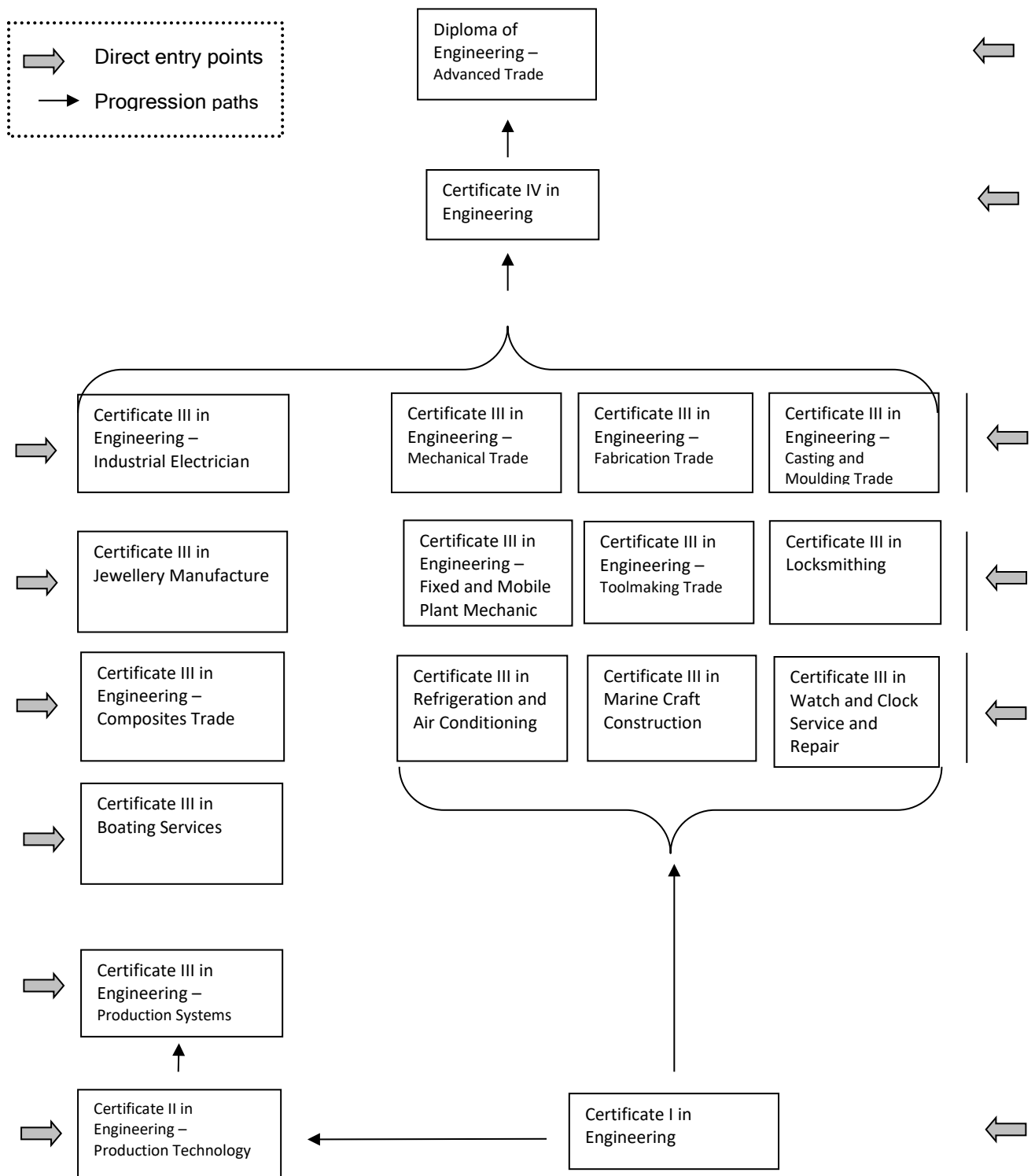
This qualification provides competencies required by an employee who works within the boating services industry. They can be employed in and around marinas and slipways. Job roles include routine maintenance, repair and preparation of marine craft and general operational duties in a marina and slipway environment.

## **Watch Clock Service and Repair**

### *MEM31019 Certificate III in Watch and Clock Service and Repair*

This qualification provides trade-level competencies required by a watch and clock service and repair tradesperson carrying out a wide range of work. Watch and clock service and repair tradespersons may work in a variety of watch and clock service related businesses, including retail stores, manufacturer service centres and specialist watch and clock service repair businesses.

## Pathways to a career through the Manufacturing and Engineering Training Package Qualifications



## Prerequisite Units and Prerequisite Pathways

The MEM Manufacturing and Engineering Training Package units of competency are built on a structure of accumulated skills and knowledge. This means that there are hierarchies of skills and knowledge that are built up from a range of competencies. This may have an impact on training and assessment delivery strategies.

Any units of competency that underpin others are listed as prerequisites. In some cases, there are options within the prerequisites. These combinations reflect the fact that different 'skill paths' may be taken to reach a unit of competency. Where a number of skills and knowledge development options to achieve a unit of competency are given, then the most appropriate option should be chosen. Unless indicated otherwise, the prerequisite units count towards the achievement of the qualification requirements.

## Competency Field

The competency standards are divided into 'fields' as convenient groupings of units to assist the organisation of the competency standards and to help users in the selection of relevant competency standards. The fields do not set up barriers to accessing any competency units in a field, or between fields.

## Application of the Competency

This sub-section describes more of the unit of competency's scope and limitation as well as purpose and operation in different contexts, for example, by showing how it applies in the workplace. It also contains an indication of other units that may be required in particular circumstances known as related units as well as units that are known as mutually exclusive. For example, 'this unit should not be selected when unit MEM18055 Dismantle, replace and assemble engineering components has already been selected'.

In some cases, certain units of competency contain content that, whilst capable of being interpreted as inconsistent with the Standards for Training Packages, is necessary given the importance of the direct association between competency and skills-related pay structures contained in key industrial instruments, including Awards and Certified Agreements.

The content in question is designed to give unambiguous and enforceable direction to users of the Training Package about how the unit is intended to be applied in order to ensure that duplication is minimised, skills pathways are not compromised and that unit selection is appropriate from an industrial outcome perspective.

For example, some of the units and qualifications contain directions in relation to the application of the units and/or qualifications that are required to ensure that they are applied as intended and in a manner that is consistent with longstanding industrial arrangements. The nature of the direction takes a number of forms such as:

1. Directions that limit the scope of a unit and make clear what the unit does or does not cover:

For example, unit MEM05011 Assemble fabricated components contains a statement in the application:

"Where skills for the assembly of fabricated engineering components are required unit MEM18006 Perform precision fitting of engineering components should also be selected"

This statement is required to ensure that proper consideration is given to the selection of critical additional units in the selection of the primary unit under consideration. The statement gives coherence to the application of the principal unit by indicating that the:

'skills for the assembly of fabricated engineering components' are not covered by the unit.



## 2. Directions that prevent inappropriate selections or duplication of units

Alternatively, some units contain statements with the reverse effect, which is to advise that certain units should not be selected together as they effectively duplicate much of their content but from the perspective of different vocational fields, i.e. production machining units should not be selected with trade-level machining units as they are designed for specifically different applications.

For example, the application of unit *MEM07001 Perform operational maintenance of machines/equipment* contains directions that:

“This unit of competency defines the skills and knowledge required to carry out programmed safety and maintenance checks on machines/equipment.

It applies in a manufacturing setting where routine programmed operational maintenance to machines/equipment is required. It is not intended to be used where higher-level maintenance activities are performed.

This unit should not be selected when any of the following are selected:

- MEM18055 Dismantle, replace and assemble engineering components
- MEM18006 Perform precision fitting of engineering components
- MEM07005 Perform general machining.”

This direction is necessary where experience indicates that users often inadvertently package inappropriate units together or fail to select critical units required to reflect the totality of the skills required where the unit in question is not specifically designated as a prerequisite. This can occur when the user assumes that certain contingent applications are covered by a unit when in fact they are not and require the selection of additional units.

### **Band**

Many of the units of competency are also divided into ‘Bands’, with some overlap between them. The allocation of units to different Bands recognises the inherent differences in the level of difficulty of skills used in the industry. For example, Band B units represent skills with more depth and complexity than Band A units. At the same time, the large range of units in each Band allows enterprises, employees and students a wide choice. Band E units are independent units developed for the boating services qualifications.

Some units are regarded as both Band A and Band B units. Use of these dual Band units is limited. These units are identified in the units themselves by way of a note.

### **Unit Weight**

Many units of competency have an allocated weight shown as ‘unit weight’. This weighting is defined in ‘points’. These points’ weightings are used in the packaging rules for some of the qualifications. The units selected for the qualification must have a combined point’s value equal to the points value specified for the various components of the qualification. These combined points total also include the points for any prerequisite units involved.

Note that the points for any particular unit can only be counted once in each qualification. For example, if a unit is selected to be part of a qualification and it is also a prerequisite for another selected unit, then the points for that unit can only be counted once.

## Notes

Special notes are included in some units, for example, where the unit is a dual Band unit.

## Qualification Pathways

Approved occupational or functional pathway descriptors for use in qualification titles are listed in the section below - **Qualification titles - additional descriptors**.

Reference to other occupational or functional pathways may be included on any qualification statement that is issued. This could be achieved by adding a pathway descriptor below the formal title of the qualification as shown in example 1 or by an additional sentence as shown in example 2 below.

### Example 1

Certificate II in Engineering – Production Technology  
Production Machine Operation pathway

### Example 2

Certificate II in Engineering - Production Technology  
Achieved through the Production Machine Operation pathway

Competency 'fields' may give some guidance when selecting units of competency to suit a particular qualification industry descriptor and/or occupational or functional descriptor. For instance, the Machine and Process Operations field contains units that may be suitable for the qualification in the above example focussing on Production Machine Operation.

Note that fields do not set up barriers to accessing the various qualifications. Units may be drawn from a number of fields to form a qualification.

## Prerequisite Units and Paths

The prerequisite units section within a unit of competency indicates whether other specific competencies are required to support those competencies included in that particular unit.

For example: A person must have the competencies included in the unit *MEM13004 Work safely with molten metals/glass* to support a number of other units in the Casting and Moulding field, such as *MEM04001 Operate melting furnaces*.

Where there are options within the prerequisites then the most appropriate option should be chosen.

## Qualification Pathways

There are many ways in which a person can gain a national qualification. Existing employees, trainees, apprentices, or pre-employment students may obtain qualifications. The achievement of competence is what matters, not the way in which it is achieved.

Possible pathways permitted by the respective qualifications may include:

- Assessment only pathway
- Combination of on-the-job and institution-based training
- Institution-based training programs
- On-the-job training.

## Skills recognition pathways including Australian Apprenticeships

The MEM Manufacturing and Engineering Training Package provides national qualification outcomes based on recognition of competency achievement. These qualifications can be accessed through

traineeship and apprenticeship pathways, where permissible, under the Australian Apprenticeships Programme.

Many of these qualifications may also be achieved through other pathways which do not involve a contract of training, such as recognition of prior learning.

In all cases, achievement or recognition of competence is necessary in all of the required units of competency to be awarded a national qualification.

### Customisation of qualifications

All qualifications in the MEM Manufacturing and Engineering Training Package have the capacity for customisation to suit the needs of enterprises and learners. Options for selecting units of competency are included to enable customised training pathways to be followed and recognised by a qualification.

### Qualification titles – additional descriptors

An additional descriptor may be added to some qualification titles to illustrate a particular skills profile or defined occupation. This may be achieved by the addition of an occupational/functional pathway descriptor after the qualification title as shown on the qualification and/or transcript. This additional descriptor must be drawn from the approved list provided for each qualification and must be shown in brackets for example, Certificate III in Engineering – Fabrication Trade (Surface Finishing). The Certificate III in Engineering – Mechanical Trade and Certificate III in Engineering Fabrication Trade describe the requirements for the use of descriptors. In the Certificate IV in Engineering and Diploma of Engineering – Advanced Trade qualifications there are no specific requirements associated with the use of the listed descriptors other than their use should reflect the choice of units of competency in the qualification and that they should reflect the nature of the occupation or the function. No other changes may be made to the qualification titles. Note that the addition of one of these descriptors to a qualification does not change the qualification's formal title or unique national code.

Reference to other occupational or functional pathways may be included on any qualification statement that is issued. This could be achieved by adding a pathway descriptor or sentence below the formal title of the qualification as described above under *Qualification pathways*.

A summary of approved additional descriptors for qualification titles is shown below.

### Summary of approved additional descriptors for qualification titles

Code	Title	Approved additional descriptors
MEM10119	Certificate I in Engineering	There are no approved additional descriptors for this qualification
MEM20219	Certificate II in Engineering - Production Technology	There are no approved additional descriptors for this qualification
MEM30119	Certificate III in Engineering - Production Systems	There are no approved additional descriptors for this qualification
MEM30219	Certificate III in Engineering - Mechanical Trade	Machining; Fitting; Fitting/Machining
MEM30319	Certificate III in Engineering - Fabrication Trade	Boilermaking; Welding; Boilermaking/welding; Sheetmetal working; Blacksmithing; Surface Finishing
MEM30619	Certificate III in Jewellery Manufacture	There are no approved additional descriptors for this qualification
MEM30719	Certificate III in Marine Craft Construction	There are no approved additional descriptors for this qualification

Code	Title	Approved additional descriptors
MEM30819	Certificate III in Locksmithing	There are no approved additional descriptors for this qualification
MEM30919	Certificate III in Boating Services	There are no approved additional descriptors for this qualification
MEM31019	Certificate III in Watch and Clock Service and Repair	There are no approved additional descriptors for this qualification
MEM31119	Certificate III in Engineering - Composites Trade	There are no approved additional descriptors for this qualification
MEM31219	Certificate III in Engineering – Industrial Electrician	There are no approved additional descriptors for this qualification
MEM31319	Certificate III in Refrigeration and Air Conditioning	There are no approved additional descriptors for this qualification
MEM31419	Certificate III in Engineering – Fixed and Mobile Plant Mechanic	There are no approved additional descriptors for this qualification
MEM31519	Certificate III in Engineering - Toolmaking Trade	There are no approved additional descriptors for this qualification
MEM31719	Certificate III in Engineering – Casting and Moulding Trade	There are no approved additional descriptors for this qualification
MEM40119	Certificate IV in Engineering	Casting and Moulding; CNC programming; Fluid Power; Boilermaking; Instrumentation; Maintenance; Marine Electronics; Mechatronics; Patternmaking; Refrigeration and Air Conditioning; Robotics; Sheetmetal; Toolmaking; Watch and Clock Service and Repair; Welding; Blacksmithing; Surface Finishing
MEM50119	Diploma of Engineering - Advanced Trade	Casting and Moulding; CNC programming; Fluid Power; Heavy Fabrication; Instrumentation; Maintenance; Marine Electronics; Mechatronics; Metrology; Non-Destructive Testing; Patternmaking; Refrigeration and Air Conditioning; Robotics; Toolmaking; Watch and Clock Service and Repair; Welding; Blacksmithing; Surface Finishing

## Pathway for Tradespersons to achieve Certificate IV in Engineering and Diploma of Engineering – Advanced Trade

### ***MEM40119 Certificate IV in Engineering***

The minimum requirements for this qualification can be met by holders of one of the following qualifications or equivalent with the completion of additional units of competency drawn from:

- Group A elective units to a minimum value of 12 points and units
- Group B to bring the total value of additional units to 36 points (note that additional units are those units not included in the Certificate III qualification already held):
  - MEM30219 Certificate III in Engineering – Mechanical Trade

- MEM30319 Certificate III in Engineering – Fabrication Trade
- MEM30719 Certificate III in Marine Craft Construction
- MEM30819 Certificate III in Locksmithing
- MEM31019 Certificate III in Watch and Clock Service and Repair
- MEM31219 Certificate III in Engineering – Industrial Electrician
- MEM31319 Certificate III in Refrigeration and Air Conditioning
- MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic
- MEM31519 Certificate III in Engineering – Toolmaking Trade
- MEM31719 Certificate III in Engineering – Casting and Moulding Trade

### ***MEM50119 Diploma of Engineering – Advanced Trade***

The minimum requirements for this qualification can be met by holders of one of the following qualifications or equivalent with the completion of the Core units of competency as specified in the Diploma as well as additional units of competency drawn from:

- Group A elective units to a maximum value of 24 points and
  - Group B and Group C (units to a value of 12 points may be selected from Group B) to bring the total value of additional units to 44 points (note that additional units are those units not included in the Certificate III qualification already held):
- MEM30219 Certificate III in Engineering – Mechanical Trade
  - MEM30319 Certificate III in Engineering – Fabrication Trade
  - MEM30719 Certificate III in Marine Craft Construction
  - MEM30819 Certificate III in Locksmithing
  - MEM31019 Certificate III in Watch and Clock Service and Repair
  - MEM31219 Certificate III in Engineering – Industrial Electrician
  - MEM31319 Certificate III in Refrigeration and Air Conditioning
  - MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic
  - MEM31519 Certificate III in Engineering – Toolmaking Trade
  - MEM31819 Certificate III in Engineering – Casting and Moulding Trade

In addition to the above, the minimum requirements for this qualification can also be met by holders of the MEM40119 Certificate IV in Engineering subject to the completion of the core units of competency as well as additional units drawn from:

- Group A elective units to bring the total value of the additional core units and the additional elective units to 24 points.

### **Advice on allocation of unit points weighting**

#### ***Classification levels, points and AQF level***

Job classifications under the Manufacturing and Associated Industries and Occupations Award 2010 (the Award) reflect the desire of the industry parties to maintain a skills-based classification structure based on measures representing the relative value of the skills required to perform work.

The Award has two methods of describing the skill levels required for classification at particular levels of the classification structure. The first is a reference to a 'minimum training requirement' for each classification level that can be met by individuals holding particular qualifications recognised through the Manufacturing and Engineering Training Package for each level.

Secondly, the Award makes reference to the implementation of the Metal and Engineering Industry Competency Standards consistent with the provisions contained in the *National Metal and Engineering Industry Competency Standards (NMEICS) Implementation Guide*. This *NMEICS Implementation Guide* is required to be used in enterprises whenever the classification of an employee/s is called into question or

when the competency standards are being used in an enterprise for the purposes of classifying employees or positions within the industrial award classification structure.

The *NMEICS Implementation Guide* includes a listing of award classification levels, commencing at the lowest level of C14 and rising to C1. Each classification level for trade and production work up to C5 has an allocated points value that reflects the value of the skills required for classification at that level.

Classifications above C8 have an additional requirement that restricts the selection of units of competency to those determined to require a greater depth of knowledge and/or experience [skill] than those available at lower levels, from C14 to C8.

Classification level 10 (C10) is taken as a benchmark, with wage relativities set from this level (as a percentage less than, equal to, or greater than). The C10 level has a point's allocation of 96 points. This benchmark level is commonly associated with base trades workers, such as fitters, machinists, fabricators and electrical trades. The points required for classification levels below C10 have lower point's requirements, and those above require a greater number of points.

The MEM Manufacturing and Engineering Training Package includes qualifications ranging from Certificate I to Diploma of Engineering - Advanced Trade. Of these, trade and production related qualifications use points weightings as the basis of their packaging rules. A points weighting is assigned to each MEM Manufacturing and Engineering Training Package unit of competency where the unit is allocated to a qualification with packaging rules that rely on point's weightings. Relevant units of competency must be selected according to the packaging rules so that the total number of required points is achieved.

This is important to ensure that the packaging rules for qualifications in the Training Package reflect the relative skill requirements of the industry and the value that the industry places on the respective skill levels.

Examples of how the points weightings fit into the packaging rules are shown below in the packaging rules for two of the MEM qualifications.

To be awarded the *Certificate III in Engineering – Fabrication Trade*, units of competency to the value of 96 points must be achieved, chosen as outlined below:

- All core units of competency listed below (totalling 33 points)
- Elective units of competency to a minimum value of 40 points from one of either Group A, B, C, D, E, F or G
- Elective units of competency to a maximum value of 23 points from Group H electives to bring the total value to 96 points.

To be awarded the *MEM40119 Certificate IV in Engineering* units of competency to a minimum value of 132 points must be achieved, chosen as outlined below:

- All core units of competency listed below (totalling 33 points)
- Elective units of competency to a minimum value of 12 points from Group A
- Elective units of competency to a maximum value of 87 points from Group B to bring the total value to 132 points.

### ***Allocation of unit points weighting***

The allocation of points weighting to MEM Manufacturing and Engineering Training Package units of competency is fundamentally based on the value of the competency in its application in the workplace.

The following statement, drawn from the *NMEICS Implementation Guide*, is used as the principal in setting unit points weightings:

Not all skills are equally complex, so it is unrealistic to develop competency standards in which each competency unit is treated as if it represents an equal 'amount' of competence. The competency standards assign a number of 'points' to each competency unit to indicate its relative weighting, or unit weight.

In assigning points to each competency unit, the industrial parties took in to account several factors, including:

- The amount of formal and on-the-job training needed to demonstrate competency in the skill required
- The amount of background knowledge and experience needed
- The complexity of the skill.

These factors are viewed in the light of other information such as:

- Points allocated to similar units of competency
- The relative level/s at which the unit will be used
- The type of work where the unit is used
- The intended context for the application of the skill.

A further consideration used is the relative value of work as defined at a particular award classification level.

## References

1. Manufacturing and Associated Industries and Occupations Award 2010, Fair Work Australia
2. National Metal and Engineering Industry Competency Standards Implementation Guide, MERS ITAB, November 1999

[Vetnet.education.gov.au](http://Vetnet.education.gov.au)

[National Metal and Engineering Industry Competency Standards Implementation Guide 1999](#)

## Key work and training requirements in the industry

All MEM Manufacturing and Engineering Training Package qualifications are designed to provide an industry recognised skills profile related to work performed in metal, engineering, manufacturing and associated industries.

### *MEM10119 Certificate I in Engineering*

The Certificate I in Engineering is designed to assist workers entering employment as engineering/manufacturing employees in metal, engineering, manufacturing and associated industries.

Achievement of the *MEM10119 Certificate I in Engineering* will provide a set of competencies that collectively open pathways into employment and/or further study in the engineering/manufacturing industry.

### *MEM20219 Certificate II in Engineering – Production Technology*

The Certificate II in Engineering – Production Technology provides the competencies required by engineering/manufacturing employees in metal, engineering, manufacturing and associated industries in a wide range of workplace areas, including:



- Production
- Casting and moulding
- Machine processing
- Stores
- Warehousing
- Surface finishing
- Commissioning/decommissioning of split air conditioning systems.

Completion of this qualification with the appropriate competencies for commissioning/decommissioning of split air conditioning systems will enable the qualified person to apply for an Australian Refrigeration Council (ARC) Refrigerant Handling Licence for Split Systems

This qualification is not suited and should not be used for people who are not employed in an engineering production or manufacturing environment. It is not suited and should not be used for school students unless they are formally engaged in a traineeship in accordance with the Australian Apprenticeships policy.

### *MEM30119 Certificate III in Engineering – Production Systems*

The Certificate III in Engineering – Production Systems provides the competencies required by workers employed in an engineering production or manufacturing environment. It applies to employees who are required to operate across more than one category within those environments and elsewhere when required.

This qualification is not suited and should not be used for people who are not employed in an engineering production or manufacturing environment. It is not suited and should not be used for school students unless they are formally engaged in a traineeship in accordance with the Australian Apprenticeships policy.

### *MEM30219 Certificate III in Engineering – Mechanical Trade*

This qualification provides trade level competencies for an engineering tradesperson – mechanical carrying out a wide range of mechanical work including undertaking fitting, assembly, manufacture, installation, modification, testing, fault finding, maintenance and service of mechanical equipment, machinery and the use of machine tools. Mechanical tradespersons are employed in a wide variety of industry sectors, including workshops, jobbing environments, maintenance and the like.

This qualification can be packaged to suit specific trade specialisations, including:

- Machining
- Fitting
- Fitting/machining.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM30319 Certificate III in Engineering – Fabrication Trade*

This qualification provides trade-level competencies for an engineering tradesperson – fabrication carrying out a wide range of fabrication work, including undertaking metal fabrication, structural steel erection, sheet metal work, welding, blacksmithing and surface finishing. Fabrication tradespersons are employed in production and jobbing environments, light and heavy fabrication workshops and the like.

This qualification can be packaged to suit specific trade specialisations, including:

- Boilermaking
- Welding
- Boilermaking/welding
- Sheetmetal working



- Blacksmithing
- Surface finishing.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM30619 Certificate III in Jewellery Manufacture*

This qualification provides trade-level competencies for a jewellery manufacture tradesperson carrying out a wide range of work, including undertaking designing and making jewellery and small objects using a wide range of materials including metals, stones, woods, plastics and fibres. Jewellery manufacture tradespersons are employed in small, medium and large manufacturing firms.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM30719 Certificate III in Marine Craft Construction*

This qualification provides trade-level competencies for a marine craft construction tradesperson carrying out a wide range of work, including undertaking manufacturing and repairs of boats in fibre-reinforced plastics, timber and metal and marine/boat yard operations, fitting out of internal and external components of vessels and installation of engineering drive systems. Marine craft construction tradespersons are employed as shipwrights and boat builders in a wide variety of industry sectors, including workshops, jobbing environments, maintenance and the like including the manufacture and repair of boats and marine craft in fibre-reinforced plastics, timber and metal and marine/boat yard operations, fitting out of internal and external components of vessels and installation of engineering drive systems.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM30819 Certificate III in Locksmithing*

This qualification provides trade-level competencies for a locksmithing tradesperson carrying out a wide range of work, including undertaking the repair, manufacture and installation of locking and security systems. Locksmiths are employed in domestic, automotive and industrial applications.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM30919 Certificate III in Boating Services*

This qualification provides level competencies required by an employee who works within boating services industry carrying out a wide range of boating services work, including the general maintenance of structures, hulls, engines and on board mechanical work and also includes maintaining the marine environment. They are employed in and around marinas and slipways, and in boat and ship building, maintenance and repair facilities.

This qualification should be undertaken through an apprenticeship training contract training under Australian Apprenticeships policy or through a formal recognition process.

### *MEM31019 Certificate III in Watch and Clock Service and Repair*

This qualification provides trade-level competencies required by a watch and clock service and repair tradesperson carrying out a wide range of work, including undertaking the disassembly, assembly, installation, adjustment, replacement, modification, testing, fault finding, and maintenance and service of watch and clock cases, mechanisms and other relevant components. Watch and clock service and repair tradespersons are employed in a variety of watch and clock service related businesses, including retail stores, manufacturer service centres and specialist watch and clock service repair businesses.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM31119 Certificate III in Engineering – Composites Trade*

This qualification provides trade-level competencies for a composites tradesperson carrying out a wide range of work, including laying up composites, selecting, handling, using and storing materials and components, undertaking repairs and modifications, adjusting resin chemicals and selecting and using joining techniques. Composite tradespersons are employed in manufacturing, workshops, repair facilities, marine environments, defence or government facilities including aerospace.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM31219 Certificate III in Engineering – Industrial Electrician*

This qualification provides trade-level competencies required for an industrial electrician tradesperson carrying out a wide range of work, including the ability to select, set up and install, test, fault find, repair and maintain electrical systems and equipment in buildings and industrial environments including oil/gas installations, mine sites, processing plants and the like.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

**Refer to Appendix 2** for detailed information on implementation and training advice for the industrial electrician qualification.

### *MEM31319 Certificate III in Refrigeration and Air conditioning*

This qualification provides trade-level competencies for a heating, ventilation, air -conditioning and refrigeration (HVAC/R) tradesperson carrying out a wide range of work, including assembling, installing, fault finding, maintaining and repairing industrial, commercial and domestic air conditioning and refrigeration systems and equipment. Refrigeration and air conditioning mechanics are employed in domestic and commercial environments, workshops as well maintenance.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic*

This qualification provides trade level competencies for an Engineering Tradesperson – Mechanical specialising in diesel fitting and plant mechanics carrying out a wide range of work including manufacturing, assembly and commissioning of mobile and stationary plant, servicing, diagnosis and rectification of faults, condition monitoring, and preventative maintenance. Diesel fitters are employed in heavy vehicle and earthmoving workshops, mines, maintenance environments and the like.

This qualification should be undertaken through an apprenticeship contract of training under Australian Apprenticeships or through the formal trade recognition process.

### *MEM31518 Certificate III in Engineering – Toolmaking Trade*

This qualification provides trade-level competencies for an engineering tradesperson – mechanical specialising in toolmaking carrying out a wide range of work, including the manufacture, modification and maintenance of tooling. Toolmakers are employed in manufacturing, workshops, maintenance and the like where they can specialise as die casters, die sinkers, jig makers (metal), plastic mould makers and press toolmakers.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

### *MEM31819 Certificate III in Engineering – Casting and Moulding*

This qualification provides trade-level competencies for an engineering tradesperson – fabrication specialising in casting and moulding carrying out a wide range of work, including producing sand moulds by hand or use moulding machines, pour and trim castings and operate and monitor melting furnaces. Casting and moulding tradespersons are employed primarily in foundries.

This qualification should be undertaken through an apprenticeship training contract under Australian Apprenticeships policy or through the formal trade recognition process.

#### *MEM40119 Certificate IV in Engineering*

This qualification provides the competencies required by a higher engineering tradesperson carrying out a wide range of engineering work undertaken in the fields of refrigeration and air conditioning, casting and moulding, computer numerically controlled (CNC) programming, fluid power, heavy fabrication, instrumentation, maintenance, marine electronics, mechatronics, patternmaking, robotics, toolmaking, welding and watch and clock services and repair, as well as post-trade work across wide variety of metal, engineering, manufacturing and related industries.

While there is no qualification entry requirement, it is assumed that the learner is either already a tradesperson with access to structure on and off-the-job training or is an apprentice under an Australian Apprenticeship arrangement. It should not be used as a pre-employment or pre-apprenticeship program. It is also designed for tradespersons who can gain credit towards this qualification for relevant competencies gained from a relevant MEM Manufacturing and Engineering Training Package Certificate III qualification.

#### *MEM50119 Diploma of Engineering – Advanced Trade*

This qualification provides the competencies required by an advanced engineering tradesperson - Level II within the metal, engineering, manufacturing and associated industries or at equivalent levels in other industries where engineering tradespersons work in the fields of casting and moulding, computer numerically controlled (CNC) programming, fluid power, heavy fabrication, instrumentation, maintenance, marine electronics, mechatronics, non-destructive testing, refrigeration and air conditioning, robotics, toolmaking, watch and clock service and repair and welding.

In some jurisdictions, this qualification can be undertaken through an apprenticeship training contract under Australian Apprenticeships policy. It can be achieved through the formal trade recognition process. It should not be used as a pre-employment or pre-apprenticeship program.

It is also designed for tradespersons who can gain credit towards this qualification for relevant competencies gained from relevant MEM Manufacturing and Engineering Training Package Certificate III and Certificate IV qualifications.

## Regulation and licensing implications for implementation

While no specific licensing or certification requirements apply to the qualifications in MEM Manufacturing and Engineering Training Package at the time of publication (except for *MEM31219 Certificate III in Engineering – Industrial Electrician*), there may be some units in the qualifications that have licensing or regulatory requirements depending on the work context. Local requirements should be checked, for example Australian Refrigeration Council (ARC) for a *Refrigerant Handling Licence for Split Systems*.

### **MEM31219 Certificate III in Engineering – Industrial Electrician**

This qualification is designed to support an application in each state and territory for a license to practise as an industrial electrician. Other supporting documentation may be required.

#### *In Western Australia*

*Copy of Certificate III in Engineering – Industrial Electrician issued by the Registered Training Organisation (RTO) and additional RTOs are to include a summary of work location and type with each apprentice's licence application, as this provides the Licensing Board with useful information about:*

- *Where the apprentice has worked in the various stages of his/her apprenticeship (the nature of the business or of that part of the company, and the physical location);*
- *How long the apprentice was in that location; and*
- *The type of work in which the apprentice participated (e.g. 24/7 maintenance crew, or new construction installing work etc).*

*Precise information on licensing can be obtained from Department of Commerce – Energy Safety, Licensing enquires on Tel: (+618) 6251 1900 or [energylicensing@commerce.wa.gov.au](mailto:energylicensing@commerce.wa.gov.au)*

Local regulations in all the other states and territories should be checked for details regarding the issuance of a licence pertaining to the above qualification.

**Refer to Appendix 2** for full details on this qualification.

## Implementation Information

RTOs will need to implement a comprehensive training and assessment strategy for each qualification that they deliver.

This implementation information is provided to assist RTOs to develop their learning and assessment strategies to meet industry and student needs. It includes information on:

- Choosing the appropriate qualification, skill set or unit of competency
- Choosing electives as required
- Supporting students
- Delivering the training
- Assessing students.

### ***Choosing the appropriate qualification***

Where do you start? What qualification and competencies are suitable for this industry sector and this student?

This section will assist Training Package users to develop their training and assessment strategies, customise the program to meet industry sector and student needs, identify the most suitable qualification for each student and apply the volume of learning and amount of training required to comply with the Australian Qualifications Framework (AQF).

This section provides information about:

- Career pathways into and out of each qualification. There are no entry requirements for any of the MEM Manufacturing and Engineering Training Package qualifications.
- Qualifications, occupational outcomes and the AQF.

### ***Career Pathways***

The following table presents suggested pathways into and out of the MEM qualifications. The pathways suggested are in no way mandatory and the qualifications listed support direct entry.

Qualification	Pathway in	Pathway out
<b>Engineering/manufacturing</b>		
MEM10119 Certificate I in Engineering	NA	MEM20219 Certificate II in Engineering – Production Technology
		MEM30119 Certificate III in Engineering – Production Systems
		MEM30219 Certificate III in Engineering – Mechanical Trade
		MEM30319 Certificate III in Engineering – Fabrication Trade
		MEM30719 Certificate III in Marine Craft Construction
		MEM30819 Certificate III in Locksmithing

<b>Qualification</b>	<b>Pathway in</b>	<b>Pathway out</b>
		MEM31019 Certificate III in Watch and Clock Service and Repair
		MEM31119 Certificate III in Engineering – Composites Trade
		MEM31319 Certificate III in Refrigeration and Air Conditioning
		MEM31519 Certificate III in Engineering – Toolmaking Trade
		MEM31719 Certificate III in Engineering – Casting and Moulding Trade
		MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
<b>Production</b>		
MEM20219 Certificate II in Engineering – Production Technology	MEM10119 Certificate I in Engineering	MEM30119 Certificate III in Engineering – Production Systems
		MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
MEM30119 Certificate III in Engineering – Production Systems	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
	MEM20219 Certificate II in Engineering – Production Technology	MEM50119 Diploma of Engineering – Advanced Trade
<b>Engineering</b>		
MEM30219 Certificate III in Engineering – Mechanical Trade	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
MEM30319 Certificate III in Engineering – Fabrication Trade	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
MEM31119 Certificate III in Engineering – Composites Trade	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering

<b>Qualification</b>	<b>Pathway in</b>	<b>Pathway out</b>
		MEM50119 Diploma of Engineering – Advanced Trade
MEM31219 Certificate III in Engineering – Industrial Electrician	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering  MEM50119 Diploma of Engineering – Advanced Trade
MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering  MEM50119 Diploma of Engineering – Advanced Trade
MEM31519 Certificate III in Engineering – Toolmaking Trade	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering  MEM50119 Diploma of Engineering – Advanced Trade
MEM31719 Certificate III in Engineering – Casting and Moulding	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering  MEM50119 Diploma of Engineering – Advanced Trade
MEM40119 Certificate IV in Engineering	MEM10119 Certificate I in Engineering  MEM20219 Certificate II in Engineering – Production Technology  MEM30119 Certificate III in Engineering – Production Systems  MEM30219 Certificate III in Engineering – Mechanical Trade  MEM30319 Certificate III in Engineering – Fabrication Trade  MEM30719 Certificate III in Marine Craft Construction  MEM30819 Certificate III in Locksmithing  MEM31019 Certificate III in Watch and Clock Service and Repair	MEM50119 Diploma of Engineering – Advanced Trade

Qualification	Pathway in	Pathway out
MEM50118 Diploma of Engineering – Advanced Trade	MEM31319 Certificate III in Refrigeration and Air Conditioning	NA
	MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic	
	MEM31519 Certificate III in Engineering – Toolmaking Trade	
	MEM31719 Certificate III in Engineering – Casting and Moulding	
	MEM10119 Certificate I in Engineering	
	MEM20219 Certificate II in Engineering – Production Technology	
	MEM30119 Certificate III in Engineering – Production Systems	
	MEM30219 Certificate III in Engineering – Mechanical Trade	
	MEM30319 Certificate III in Engineering – Fabrication Trade	
	MEM30719 Certificate III in Marine Craft Construction	
	MEM30819 Certificate III in Locksmithing	
	MEM31019 Certificate III in Watch and Clock Service and Repair	
	MEM31319 Certificate III in Refrigeration and Air Conditioning	
	MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic	
	MEM31519 Certificate III in Engineering – Toolmaking Trade	



<b>Qualification</b>	<b>Pathway in</b>	<b>Pathway out</b>
	MEM31719 Certificate III in Engineering – Casting and Moulding	
	MEM40119 Certificate IV in Engineering	
<b>Jewellery Manufacture</b>		
MEM30619 Certificate III in Jewellery Manufacture	MEM10119 Certificate I in Engineering	MEM40311 Certificate IV in Advanced Jewellery Manufacture
		MEM50311 Diploma of Jewellery and Object Design
		MEM60211 Advanced Diploma of Jewellery and Object Design
<b>Marine Craft Construction</b>		
MEM30719 Certificate III in Marine Craft Construction	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
<b>Locksmithing</b>		
MEM30819 Certificate III in Locksmithing	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade
<b>Boating Services</b>		
MEM30919 Certificate III in Boating Services	MEM10205 Certificate I in Boating Services	MEM40205 Certificate IV in Boating Services
	MEM20305 Certificate II in Boating Services	
<b>Watch and Clock Service and Repair</b>		
MEM31019 Certificate III in Watch and Clock Service and Repair	MEM10119 Certificate I in Engineering	MEM40119 Certificate IV in Engineering
		MEM50119 Diploma of Engineering – Advanced Trade

## Refrigeration and Air Conditioning

MEM31319 Certificate III in  
Refrigeration and Air  
Conditioning

MEM10119 Certificate I in  
Engineering

MEM40119 Certificate IV in  
Engineering

MEM50119 Diploma of Engineering  
– Advanced Trade

### ***Qualifications, occupational outcomes and the AQF***

RTOs must meet the requirements of the AQF and ensure that individual students are enrolled in appropriate qualifications. This section provides the AQF qualification descriptor and the MEM Manufacturing and Engineering Training Package qualification description. This will assist RTOs to determine the most suitable qualification level for each student.

The AQF qualification descriptors include the volume of learning. RTOs must comply with the AQF, apply the volume of learning to training programs, and develop and implement training and assessment strategies that are consistent with the AQF.

The AQF provides the volume of learning allocated to a qualification. This includes all teaching, learning and assessment activities that are required to be undertaken by a typical student to achieve the learning outcomes. These activities include guided learning (classes, lectures, tutorials, online or self-paced study), individual study, research, practice, learning activities in the workplace, and assessment activities.

The amount of training provided by an RTO is part of the overall volume of learning and relates primarily to formal activities (including classes and other activities, as well as workplace learning).

RTOs must consider the need to allow students to reflect on and absorb knowledge, to practise the skills in different contexts, and to learn to apply the skills and knowledge in the varied environments of workplaces before being assessed.

Where the student is an apprentice, the RTO must also meet the requirements of the Training Plan agreed to between the apprentice and the employer.

The following sections give the relevant AQF descriptor, including the volume of learning that is required, and the description of each MEM qualification.

### ***Hours of workplace practice in a functioning workplace***

The clear intention of industry is that the skills specified in the competency standards contained in MEM Qualifications are the industry standards that are to be met in the context of their application in the workplace ‘to the standard expected in employment’.

An integrated employment and learning model, such as that experienced in an Apprenticeship, facilitates the consolidation of competency through the integration of employment-based work and formal learning associated with the qualification specified in the Training Contract.

It is in that context that the MEM IRC has moved to specify a number of hours of workplace practice in a functioning workplace in specified units.

The workplace component of an apprenticeship is intended to be used to consolidate the learning of the apprentice through workplace practice, resulting in competency “to the standard expected in employment”.

The formula crafted by the IRC was based on that historical relationship where training based on curriculum was consolidated through workplace practice in a functioning workplace in an apprenticeship.

The multiple of workplace practice was determined at 4 hours of workplace practice for each nominal hour of formal delivery through an RTO.

This has regard for the workplace practice required to consolidate competency in the remaining units of competency that are not critical trade units.

### ***How is it intended to operate?***

The MEM IRC is not responsible, nor does it have any authority, to determine how RTO's carry out their responsibilities.

ASQA however provides guidance on how evidence relevant to the requirements of units of competency can be gathered.

#### **"Forms of evidence<sup>1</sup>**

- Evidence can be categorised as direct, indirect or supplementary evidence:
- Direct evidence is evidence that can be observed or witnessed by the assessor. This could include observation of workplace performance, oral questioning, demonstration, challenge test
- Indirect evidence is evidence of a candidate's work that can be reviewed or examined by the assessor. This could include finished products, written assignments or tests, or a portfolio of previous work performed.
- Supplementary evidence is additional evidence presented to assessors to support a candidate's claim of competence. This could include reports from supervisors, colleagues and/or clients, testimonials from employers, work diaries, evidence of training.

It is important to understand that when it comes to assessment, there is no 'hierarchy of evidence' (Department of Education, Training and Youth Affairs, 2001, p. 41.). While training packages and accredited courses describe the outcomes of assessment and provide advice about the scope and context for assessment, neither the Standards for RTOs 2015 nor training product guidelines prescribe exactly what type of evidence, or how much evidence, must be collected.

Rather, your RTO must reach an appropriate balance and ensure that, overall; the evidence collected meets the rules of evidence:

- validity—the evidence presented demonstrates the learner has the skills, knowledge and attributes as described in the module or unit of competency and associated assessment requirements
- sufficiency—the quality, quantity and relevance of evidence presented enables a judgement to be made of a learner's competency
- currency—the evidence presented is from either the present or the very recent past, and
- authenticity—the evidence presented for assessment is the learner's own work.

It is the quality of all evidence collected (including any supplementary evidence collected by another party) that is important to making a sound judgement about competence—rather than the quantity, type and form of evidence, where it was collected or who collected it."

Evidence of workplace practice does not mean, nor require, assessment in the workplace.

The table below lists the critical trade units of competency identified as of May 2019, including the minimum number of hours of workplace practice required for each unit.

	Unit code	Unit title	Minimum workplace practice
1.	MEM04010	Develop and manufacture wood patterns	800 hours
2.	MEM04011	Produce polymer patterns	320 hours
3.	MEM04012	Assemble plated patterns	320 hours
4.	MEM04013	Develop and manufacture polystyrene patterns	80 hours
5.	MEM04014	Develop and manufacture production patterns	320 hours
6.	MEM04015	Develop and manufacture vacuum forming moulds and associated equipment	240 hours
7.	MEM04016	Develop and manufacture precision models	240 hours
8.	MEM04017	Develop and manufacture gear, conveyor screw and propeller patterns	160 hours
9.	MEM04020	Supervise individual ferrous melting and casting operation	160 hours
10.	MEM04021	Supervise individual non-ferrous melting and casting operation	160 hours
11.	MEM04022	Examine appropriateness of methoding for mould	160 hours
12.	MEM04024	Produce moulds and cores by hand	160 hours
13.	MEM04025	Produce moulds and cores by hand (advanced)	480 hours
14.	MEM05010	Apply fabrication, forming and shaping techniques	320 hours
15.	MEM05011	Assemble fabricated components	320 hours
16.	MEM05014	Monitor quality of production welding/fabrications	80 hours
17.	MEM05015	Weld using manual metal arc welding process	160 hours
18.	MEM05016	Perform advanced welding using manual metal arc welding process	160 hours
19.	MEM05017	Weld using gas metal arc welding process	160 hours
20.	MEM05018	Perform advanced welding using gas metal arc welding process	160 hours
21.	MEM05019	Weld using gas tungsten arc welding process	160 hours
22.	MEM05020	Perform advanced welding using gas tungsten arc welding process	160 hours
23.	MEM05022	Perform advanced welding using oxy acetylene welding process	240 hours
24.	MEM05024	Perform welding supervision	480 hours
25.	MEM05025	Perform welding/fabrication inspection	480 hours
26.	MEM05026	Apply welding principles	160 hours
27.	MEM05036	Repair/replace/modify fabrications	160 hours

	Unit code	Unit title	Minimum workplace practice
28.	MEM05037	Perform geometric development	240 hours
29.	MEM05038	Perform advanced geometric development - cylindrical/rectangular	80 hours
30.	MEM05039	Perform advanced geometric development - conical	80 hours
31.	MEM05040	Perform advanced geometric development - transitions	160 hours
32.	MEM05042	Perform welds to code standards using flux core arc welding process	240 hours
33.	MEM05043	Perform welds to code standards using gas metal arc welding process	240 hours
34.	MEM05044	Perform welds to code standards using gas tungsten arc welding process	240 hours
35.	MEM05045	Perform pipe welds to code standards using manual metal arc welding process	240 hours
36.	MEM05046	Perform welds to code standards using manual metal arc welding process	240 hours
37.	MEM05051	Select welding processes	80 hours
38.	MEM05052	Apply safe welding practices	160 hours
39.	MEM05053	Set and edit computer controlled thermal cutting machines	160 hours
40.	MEM05054	Write basic NC/CNC programs for thermal cutting machines	160 hours
41.	MEM05055	Weld using oxy fuel gas welding process	160 hours
42.	MEM05058	Perform welds to code standards using oxy fuel gas welding process	240 hours
43.	MEM07002	Perform precision shaping/planing/slotting	160 hours
44.	MEM07004	Perform machine setting (complex)	320 hours
45.	MEM07005	Perform general machining	320 hours
46.	MEM07006	Perform lathe operations	160 hours
47.	MEM07007	Perform milling operations	160 hours
48.	MEM07008	Perform grinding operations	160 hours
49.	MEM07009	Perform precision jig boring operations	160 hours
50.	MEM07010	Perform tool and cutter grinding operations	160 hours
51.	MEM07011	Perform complex milling operations	160 hours
52.	MEM07012	Perform complex grinding operations	160 hours
53.	MEM07013	Perform machining operations using horizontal and/or vertical boring machines	160 hours
54.	MEM07014	Perform electro-discharge (EDM) machining operations	160 hours
55.	MEM07015	Set computer controlled machines and processes	80 hours

	Unit code	Unit title	Minimum workplace practice
56.	MEM07016	Set and edit computer controlled machines and processes	160 hours
57.	MEM07018	Write basic NC and CNC programs	160 hours
58.	MEM07019	Program NC and CNC machining centre	80 hours
59.	MEM07020	Program multiple spindle and/or multiple axis NC and CNC machining centre	80 hours
60.	MEM07021	Perform complex lathe operations	160 hours
61.	MEM07022	Program CNC wire cut machines	80 hours
62.	MEM07023	Program and set up CNC manufacturing cell	240 hours
63.	MEM10001	Erect structures	160 hours
64.	MEM10006	Install machine/plant	160 hours
65.	MEM10007	Modify control systems	240 hours
66.	MEM10008	Undertake commissioning procedures for plant and/or equipment	160 hours
67.	MEM12006	Mark off/out (general engineering)	160 hours
68.	MEM12007	Mark off/out structural fabrications and shapes	160 hours
69.	MEM18004	Maintain and overhaul mechanical equipment	160 hours
70.	MEM18005	Perform fault diagnosis, installation and removal of bearings	160 hours
71.	MEM18006	Perform precision fitting of engineering components	240 hours
72.	MEM18007	Maintain and repair mechanical drives and mechanical transmission assemblies	160 hours
73.	MEM18008	Balance equipment	80 hours
74.	MEM18009	Perform levelling and alignment of machines and engineering components	160 hours
75.	MEM18012	Perform installation and removal of mechanical seals	80 hours
76.	MEM18014	Manufacture press tools and gauges	320 hours
77.	MEM18015	Maintain tools and dies	160 hours
78.	MEM18016	Analyse plant and equipment condition monitoring results	160 hours
79.	MEM18017	Modify mechanical systems and equipment	320 hours
80.	MEM18018	Maintain pneumatic system components	160 hours
81.	MEM18019	Maintain pneumatic systems	160 hours
82.	MEM18020	Maintain hydraulic system components	160 hours
83.	MEM18021	Maintain hydraulic systems	160 hours
84.	MEM18022	Maintain fluid power controls	320 hours
85.	MEM18023	Modify fluid power system operation	320 hours

	Unit code	Unit title	Minimum workplace practice
86.	MEM18034	Perform engine top-end overhaul	320 hours
87.	MEM18053	Modify fluid power control systems	240 hours
88.	MEM18097	Manufacture cavity dies	320 hours
89.	MEM25003	Set up marine vessel structures	160 hours
90.	MEM25005	Construct and assemble marine vessel timber components	320 hours
91.	MEM25008	Repair marine vessel surfaces and structures	160 hours
92.	MEM25009	Form timber shapes using hot processes	80 hours
93.	MEM25010	Perform fitout procedures	160 hours
94.	MEM25013	Produce three-dimensional plugs/moulds	480 hours

## Certificate I AQF descriptor

### Purpose

The Certificate I qualifies individuals with basic functional knowledge and skills to undertake work, further learning and community involvement.

### Knowledge

Graduates of a Certificate I will have basic fundamental knowledge and understanding in a narrow area of work and learning.

### Skills

Graduates of a Certificate I will have:

- Basic skills to participate in everyday life and further learning
- Cognitive and communication skills to receive, pass on and recall information in a narrow range of areas
- Technical skills involving the use of tools appropriate to the activity and use of basic communication technologies.

### Application

Graduates of a Certificate I will demonstrate the application of knowledge and skills:

- With some autonomy in defined contexts and within established parameters
- In contexts that may include preparation for further learning, life activities and/or a variety of initial routine and predictable work-related activities including participation in a team or work group.

### Volume of learning

The volume of learning Certificate II is typically 0.5 – 1 year. This equates to 600-1200 hours.

## Certificate I qualification description

### MEM10119 Certificate I in Engineering

The *MEM10119 Certificate I in Engineering* qualification provides an entry level outcome to assist workers entering employment as engineering/manufacturing employees in metal, engineering, manufacturing and associated industries.

The units selected must provide practical skills that are relevant and useful to the area in which the person hopes to gain employment or is currently working. The group of units should incorporate both the technical and employability skills needed for work.

Achievement of the *MEM10119 Certificate I in Engineering* will provide the qualified person with a set of competencies that collectively open pathways into employment and/or further study in the engineering/manufacturing industry.



## **Certificate II AQF descriptor**

### **Purpose**

The Certificate II qualifies individuals to undertake mainly routine work and as a pathway to further learning.

### **Knowledge**

Graduates of a Certificate II will have basic factual, technical and procedural knowledge in a defined area of work and learning.

### **Skills**

Graduates of a Certificate II will have:

- Cognitive skills to access, record and act on a defined range of information from a range of sources
- Cognitive and communication skills to apply and communicate known solutions to a limited range of predictable problems
- Technical skills to use a limited range of equipment to complete tasks involving known routines and procedures with a limited range of options.

### **Application**

Graduates of a Certificate II will demonstrate the application of knowledge and skills with some accountability for the quality of own outcomes and some responsibility for own outputs in work and learning. Work involves limited autonomy and judgement in the completion of own defined and routine tasks in known and stable contexts and in collaboration with others in a team environment.

### **Volume of learning**

The volume of learning of a Certificate II is typically 0.5-1 year. This equates to 600-1200 hours.

## **Certificate II qualifications descriptions**

### **MEM20219 Certificate II in Engineering – Production Technology**

The *MEM20219 Certificate II in Engineering – Production Technology* qualification provides the competencies required by engineering/manufacturing employees in metal, engineering, manufacturing and associated industries employed carrying out a wide range of work, including production, casting and moulding, machine processing, surface finishing, stores, warehousing and commissioning/decommissioning split air conditioning systems.

## **Certificate III AQF descriptor**

### **Purpose**

The Certificate III qualifies individuals who apply a broad range of knowledge and skills in varied contexts to undertake skilled work and as a pathway for further learning.

### **Knowledge**

Graduates of a Certificate III will have factual, technical, procedural and theoretical knowledge in an area of work and learning.

## Skills

Graduates of a Certificate III will have:

- Cognitive, technical and communication skills to interpret and act on available information
- Cognitive and communication skills to apply and communicate known solutions to a variety of predictable problems and to deal with unforeseen contingencies using known solutions
- Technical and communication skills to provide technical information to a variety of specialist and non-specialist audiences
- Technical skills to undertake routine and some non-routine tasks in a range of skilled operations.

## Application

Graduates of a Certificate III will demonstrate the application of knowledge and skills with discretion and judgement in the selection of equipment, services or contingency measures, and skills to adapt and transfer skills and knowledge within known routines, methods, procedures and time constraints.

Work is in the context of taking responsibility for own outputs in work and learning, including participation in teams and taking limited responsibility for the output of others within established parameters.

## Volume of learning

The volume of learning of a Certificate III is typically 1-2 years which equates to 1200- 2400 hours. Certificate III qualifications are often the basis for trade outcomes and undertaken as part of a traineeship or apprenticeship. In these cases, up to four years may be required to achieve the learning outcomes.

## Certificate III qualifications descriptions

### **MEM30119 Certificate III in Engineering – Production Systems**

The *MEM30119 Certificate III in Engineering – Production Systems* qualification provides the competencies required by engineering/manufacturing employees in metal, engineering, manufacturing and associated industries employed carrying out a wide range of work, including production, casting and moulding, machine processing, surface finishing, stores and warehousing.

### **MEM30219 Certificate III in Engineering – Mechanical Trade**

The *MEM30219 Certificate III in Engineering – Mechanical Trade* qualification provides a trade-level outcome of an engineering tradesperson – mechanical carrying out a wide range of mechanical work, including undertaking fitting, assembly, manufacture, installation, modification, testing, maintenance and service of mechanical equipment, machinery and the use of machine tools.

### **MEM30319 Certificate III in Engineering – Fabrication Trade**

The *MEM30319 Certificate III in Engineering – Fabrication Trade* qualification provides a trade- level outcome of an engineering tradesperson – fabrication carrying out a wide range of fabrication work, including undertaking metal fabrication, structural steel erection, sheetmetal work and welding. Welding would typically conform to meet the applicable Australian/International Standards or equivalent.

### **MEM30619 Certificate III in Jewellery Manufacture**

The *MEM30619 Certificate III in Jewellery Manufacture* qualification provides a trade-level outcome of a jewellery manufacture tradesperson carrying out a wide range of jewellery manufacture work, including undertaking designing and making jewellery and small objects using a wide range of materials including metals, stones, woods, plastics and fibres.

### **MEM30719 Certificate III in Marine Craft Construction**

The *MEM30719 Certificate III in Marine Craft Construction* qualification provides a trade-level outcome of a marine craft construction tradesperson carrying out a wide range of marine craft construction work, including undertaking manufacturing and repairs of boats in fibre-reinforced plastics, timber and metal and marine/boat yard operations, fitting out of internal and external components of vessels and installation of engineering drive systems.

### **MEM30819 Certificate III in Locksmithing**

The *MEM30819 Certificate III in Locksmithing* qualification provides a trade level outcome of a locksmithing tradesperson carrying out a wide range of locksmithing work, including undertaking the repair, manufacture and installation of locking and security systems in domestic, automotive and industrial applications.

### **MEM30919 Certificate III in Boating Services**

The *MEM30919 Certificate III in Boating Services* qualification provides the competencies required by an employee who works within boating services industry carrying out a wide range of boating services work, including the general maintenance of structures, hulls, engines and on board mechanical work and also includes maintaining the marine environment.

### **MEM31019 Certificate III in Watch and Clock Service and Repair**

The *MEM31019 Certificate III in Watch and Clock Service and Repair* qualification provides a trade-level outcome of a watch and clock service and repair tradesperson carrying out a wide range of watch and clock service and repair work, including undertaking the disassembly, assembly, installation, adjustment, replacement, modification, testing, fault finding, and maintenance and service of watch and clock cases, mechanisms and other relevant components.

### **MEM31119 Certificate III in Engineering – Composites Trade**

The *MEM31119 Certificate III in Engineering – Composites Trade* qualification provides a trade-level outcome of a composites tradesperson carrying out a wide range of composites work, including laying up composites, selecting, handling, using and storing materials and components, undertaking repairs and modifications, adjusting resin chemicals and selecting and using joining techniques.

### **MEM31219 Certificate III in Engineering – Industrial Electrician**

The *MEM31219 Certificate III in Engineering – Industrial Electrician* provides a trade-level outcome of an industrial electrician required for employment working within the metal, engineering, manufacturing and associated industries where engineering tradesperson – industrial electricians work. This qualification provides competencies in the ability to select, set up and install, test, fault find, repair and maintain electrical systems and equipment in buildings and industrial environments including oil/gas installations, mine sites, processing plants and the like. The qualification covers the Essential Performance Capabilities as required by electrical regulators and includes a capstone assessment.

### **MEM31319 Certificate III in Refrigeration and Air Conditioning**

The *MEM31319 Certificate III in Refrigeration and Air Conditioning* qualification provides a trade-level outcome of a Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R) tradesperson carrying out a wide range of work, including assembling, installing, maintaining and repairing industrial, commercial and domestic air conditioning and refrigeration systems and equipment.

### **MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic**

The *MEM31419 Certificate III in Engineering – Fixed and Mobile Plant Mechanic* qualification provides a trade-level outcome of an engineering tradesperson – mechanical specialising in diesel fitting and plant mechanics carrying out a wide range of work, including manufacturing, assembly and commissioning of mobile and stationary plant, servicing, diagnosis and rectification of faults, condition monitoring, and preventative maintenance.

### **MEM31519 Certificate III in Engineering – Toolmaking Trade**

The *MEM31519 Certificate III in Engineering – Toolmaking Trade* qualification provides a trade-level outcome of an engineering tradesperson – toolmaker carrying out a wide range of work, including the manufacture, modification and maintenance of tooling.

### **MEM31719 Certificate III in Engineering – Casting and Moulding Trade**

The *MEM31719 Certificate III in Engineering – Casting and Moulding Trade* qualification provides a trade-level outcome of an engineering tradesperson – casting and moulding carrying out a wide range of work, including producing sand moulds by hand or use moulding machines, pour and trim castings and operate and monitor melting furnaces.

## **Certificate IV AQF descriptor**

### **Purpose**

The Certificate IV qualifies individuals who apply a broad range of specialised knowledge and skills in varied contexts to undertake skilled work and as a pathway for further learning.

### **Knowledge**

Graduates of a Certificate IV will have broad factual, technical and theoretical knowledge in a specialised field of work and learning.

### **Skills**

Graduates of a Certificate IV will have:

- Cognitive skills to identify, analyse, compare and act on information from a range of sources
- Cognitive, technical and communication skills to apply and communicate technical solutions of a non-routine or contingency nature to a defined range of predictable and unpredictable problems
- Specialist technical skills to complete routine and non-routine tasks and functions
- Communication skills to guide activities and provide technical advice in the area of work and learning.

### **Application**

Graduates of a Certificate IV will demonstrate the application of knowledge and skills to specialised tasks or functions in known or changing contexts with responsibility for own functions and outputs and may have limited responsibility for organisation and quantity and quality of the output of others within limited parameters.

### **Volume of learning**

The volume of learning of a Certificate IV is typically 0.5-2 years. This equates to 600-2400 hours. The Certificate IV in Engineering is the basis for trade outcomes in some jurisdictions and undertaken as part of a traineeship or apprenticeship. In these cases, up to four years may be required to achieve the learning outcomes. It can also be a shorter-duration specialist qualification which builds on the skills and knowledge of an existing Certificate III qualification

## **Certificate IV qualification description**

### **MEM40119 Certificate IV in Engineering**

The *MEM40119 Certificate IV in Engineering* qualification provides the competencies required by a higher Engineering Tradesperson carrying out a wide range of engineering work undertaken in the fields of refrigeration and air conditioning, casting and moulding, computer numerically controlled (CNC) programming, fluid power, plant mechanics, heavy fabrication, instrumentation, maintenance, marine electronics, mechatronics, patternmaking, robotics, toolmaking, welding and watch and clock services and repair as well as post trade work.

## **Diploma AQF qualification descriptor**

### **Purpose**

The Diploma qualifies individuals who apply integrated technical and theoretical concepts in a broad range of contexts to undertake advanced skilled or paraprofessional work and as a pathway for further learning.

### **Knowledge**

Graduates of a Diploma will have technical and theoretical knowledge and concepts, with depth in some areas within a field of work and learning.

### **Skills**

Graduates of a Diploma will have:

- Cognitive and communication skills to identify, analyse, synthesise and act on information from a range of sources
- Cognitive, technical and communication skills to analyse, plan, design and evaluate approaches to unpredictable problems and/or management requirements
- Specialist technical and creative skills to express ideas and perspectives
- Communication skills to transfer knowledge and specialised skills to others and demonstrate understanding of knowledge.

### **Application**

Graduates of a Diploma will demonstrate the application of knowledge with depth in some areas of specialisation, in known or changing contexts and skills to transfer and apply theoretical concepts and/or technical and/or creative skills in a range of situations with personal responsibility and autonomy in performing complex technical operations and for quantity and quality. Work involves initiative and judgement to organise the work of self and others and plan, coordinate and evaluate the work of teams within broad but generally well-defined parameters.

### **Volume of learning**

The volume of learning for a Diploma is typically 1-2 years which equates to 1200-2400 hours. The Diploma of Engineering is the basis for trade outcomes in some jurisdictions and undertaken as part of a traineeship or apprenticeship. In these cases, up to four years may be required to achieve the learning outcomes. It can also be a shorter-duration specialist qualification which builds on the skills and knowledge of an existing Certificate III or Certificate IV qualification

## Diploma qualification description

### MEM50119 Diploma of Engineering – Advanced Trade

The *MEM50119 Diploma of Engineering - Advanced Trade* qualification provides the competencies required by an advanced engineering tradesperson - Level II within the metal, engineering, manufacturing and associated industries or at equivalent levels in other industries where engineering tradespersons work. The qualification has been specifically developed to meet the needs of apprentices in an Engineering Trade who choose to study at a higher level during their apprenticeship in the above trade or for people who are existing engineering tradespersons.

## Mandatory entry requirements for qualifications

There are no entry requirements for any MEM Manufacturing and Engineering Training Package qualifications.

## Access and equity

An individual's access to training and assessment should not be adversely affected by restrictions placed on the location or context of the training and assessment beyond the requirements specified in the MEM Manufacturing and Engineering Training Package and must be bias-free.

Training Packages reflect and cater for the increasing diversity of Australia's VET clients and current and future workforce. The flexibilities offered by Training Package qualifications and units of competency enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia's economic development and social and cultural life.

## Reasonable adjustments

It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for learners with disability. Under the Disability Standards for Education 2005, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While 'reasonable adjustment' and 'unjustifiable hardship' are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of learners with and without disability. The Disability Standards and guidelines for their implementation can be downloaded at <https://education.gov.au/disability-standards-education>

An adjustment is any measure or action that a learner requires because of their disability, and which has the effect of assisting them to access and participate in education and training on the same basis as those without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the learner's disability, their views, the potential effect of the adjustment on the learner and others who might be affected, and the costs and benefits of making the adjustment.

A training provider is also entitled to maintain the academic requirements of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship.

The definition of reasonable adjustment in the Standards for Registered Training Organisations 2015 says that 'reasonable adjustment means adjustments that can be made to the way in which evidence of candidate performance can be collected. Whilst reasonable adjustments can be made in terms of the way in which evidence of performance is gathered, the evidence criteria for making competent/not yet competent decisions (and/or awarding grades) should not be altered in any way. That is, the standards

expected should be the same irrespective of the group and/or individual being assessed; otherwise comparability of standards will be compromised’.

### ***Manufacturing and Engineering limitations***

In applying the foregoing guidelines to training leading to qualifications in the MEM Manufacturing and Engineering Training Package, training providers will need to consider limitations specified in regulations and their associated Manuals of Standards. In some cases, there are specific physical standards that must be met, such as visual acuity and colour perception. Also, the conditions of work need to be considered; there would be little point in training an individual with limited mobility for a qualification associated with industrial electrician work requiring movement and the ability to climb industrial structures.

### **Foundation Skills**

Manufacturing and Engineering is a technology-based industry requiring high skill levels and the ability to troubleshoot faults in often complex components and systems. The industry is highly regulated and those working within it must be able to read and interpret instructions, standards and manuals, and document and certify the work that they perform. Work performed may be closely supervised and be inspected/certified by supervisors or may have a high level of autonomy and personal accountability. Work may be performed either individually or within teams of various sizes.

Training providers must incorporate Foundation Skills in order to design valid and reliable training and to assist in meeting the Assessment Requirements specified in the units of competency. This analysis could include:

- Reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- Designing training and assessment to address Employability Skills requirements.

Foundation Skills are deemed essential to successful learning and continuing employment. In the MEM Manufacturing and Engineering Training Package units of competency advice is provided that relevant employability skills and Core Skills are embedded in all units of competency. Employability Skills are best identified holistically at the qualification level.

If necessary, trainers and assessors can work with a language, literacy and numeracy (LLN) specialist to support the core skill requirements of the learner. This could be done in a variety of ways, such as providing extra support, mentoring, giving more opportunities for practice and so on. Details on the ACSF levels and descriptors can be obtained from:

<http://www.industry.gov.au/skills/AssistanceForTrainersAndPractitioners/AustralianCoreSkillsFramework/Pages/default.aspx>



## Mapping of MEM units to the Australian Core Skills Framework

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM03001	Perform manual production assembly	2	2	2	2	2
MEM03002	Perform precision assembly	2	3	2	2	3
MEM03003	Perform sheet and plate assembly	2	2	2	2	2
MEM03004	Perform electronic/electrical assembly (production)	2	2	2	2	2
MEM03005	Rework and repair (electrical/electronic production)	3	3	2	2	2
MEM03006	Set assembly stations	2	2	2	2	2
MEM04001	Operate melting furnaces	2	2	2	2	2
MEM04002	Perform gravity die casting	3	2	2	2	2
MEM04003	Operate pressure die casting machine	3	2	2	2	2
MEM04004	Prepare and mix sand for metal moulding	3	2	2	2	2
MEM04006	Operate sand moulding and core making machines	3	2	2	2	2
MEM04007	Pour molten metal	2	2	2	2	2
MEM04008	Fettle and trim metal castings/forgings	3	2	2	2	2
MEM04010	Develop and manufacture wood patterns	3	3	3	3	4
MEM04011	Produce polymer patterns	3	3	3	3	3
MEM04012	Assemble plated patterns	3	3	3	3	4
MEM04013	Develop and manufacture polystyrene patterns	3	3	3	3	4
MEM04014	Develop and manufacture production patterns	3	3	3	3	4
MEM04015	Develop and manufacture vacuum forming moulds and associated equipment	3	3	3	3	4
MEM04016	Develop and manufacture precision models	3	3	3	3	4
MEM04017	Develop and manufacture gear, conveyor screw and propeller patterns	3	3	3	3	4
MEM04018	Perform general woodworking machine operations	3	3	3	3	3
MEM04019	Perform refractory installation and repair	3	2	2	2	2
MEM04020	Supervise individual ferrous melting and casting operation	3	3	3	3	3
MEM04021	Supervise individual non-ferrous melting and casting operation	3	3	3	3	3
MEM04022	Examine appropriateness of methoding for mould design	4	4	4	4	4



Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM04023	Undertake prescribed tests on foundry-related materials	4	4	4	4	4
MEM04024	Produce moulds and cores by hand	3	2	2	2	2
MEM04025	Produce moulds and cores by hand (advanced)	3	2	2	2	2
MEM05001	Perform manual soldering/desoldering - electrical/electronic components	3	2	2	2	3
MEM05002	Perform high reliability soldering and desoldering	3	3	2	3	3
MEM05003	Perform soft soldering	2	2	2	2	2
MEM05004	Perform routine oxy fuel gas welding	3	3	3	2	3
MEM05005	Carry out mechanical cutting	3	3	3	2	3
MEM05006	Perform brazing and/or silver soldering	3	3	3	2	3
MEM05007	Perform manual heating and thermal cutting	3	3	3	2	3
MEM05008	Perform advanced manual thermal cutting, gouging and shaping	3	3	3	2	3
MEM05009	Perform automated thermal cutting	3	3	3	2	3
MEM05010	Apply fabrication, forming and shaping techniques	3	3	3	2	3
MEM05011	Assemble fabricated components	3	3	3	2	3
MEM05012	Perform routine manual metal arc welding	3	3	3	2	3
MEM05013	Perform manual production welding	2	2	2	2	2
MEM05014	Monitor quality of production welding/fabrications	3	3	3	3	3
MEM05015	Weld using manual metal arc welding process	3	3	3	2	3
MEM05016	Perform advanced welding using manual metal arc welding process	3	3	3	2	3
MEM05017	Weld using gas metal arc welding process	3	3	3	2	3
MEM05018	Perform advanced welding using gas metal arc welding process	3	3	3	2	3
MEM05019	Weld using gas tungsten arc welding process	3	3	3	2	3
MEM05020	Perform advanced welding using gas tungsten arc welding process	3	3	3	2	3
MEM05022	Perform advanced welding using oxy acetylene welding process	3	3	3	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM05023	Weld using submerged arc welding process	3	3	3	2	3
MEM05024	Perform welding supervision	3	3	3	3	3
MEM05025	Perform welding/fabrication inspection	3	3	3	3	3
MEM05026	Apply welding principles	3	3	3	3	3
MEM05027	Perform aluminothermic welding	2	2	2	2	2
MEM05036	Repair, replace and/or modify fabrications	3	3	3	2	3
MEM05037	Perform geometric development	3	3	3	2	3
MEM05038	Perform advanced geometric development - cylindrical/rectangular	3	3	3	2	4
MEM05039	Perform advanced geometric development - conical	3	3	3	2	4
MEM05040	Perform advanced geometric development - transitions	3	3	3	2	4
MEM05041	Weld using flame powder spraying	3	3	3	2	3
MEM05042	Perform welds to code standards using flux core arc welding process	3	3	3	2	3
MEM05043	Perform welds to code standards using gas metal arc welding process	3	3	3	2	3
MEM05044	Perform welds to code standards using gas tungsten arc welding process	3	3	3	2	3
MEM05045	Perform pipe welds to code standards using manual metal arc welding process	3	3	3	2	3
MEM05046	Perform welds to code standards using manual metal arc welding process	3	3	3	2	3
MEM05047	Weld using flux core arc welding process	3	3	3	2	3
MEM05048	Perform advanced welding using flux core arc welding process	3	3	3	2	3
MEM05049	Perform routine gas tungsten arc welding	3	3	3	2	3
MEM05050	Perform routine gas metal arc welding	3	3	3	2	3
MEM05051	Select welding processes	3	3	3	2	3
MEM05052	Apply safe welding practices	3	3	3	2	3
MEM05053	Set and edit computer controlled thermal cutting machines	3	3	3	2	3
MEM05054	Write basic NC/CNC programs for thermal cutting machines	3	3	3	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM05055	Weld using oxy fuel gas welding process	3	3	3	2	3
MEM05056	Perform routine flux core arc welding	3	3	3	2	3
MEM05057	Perform routine submerged arc welding	3	3	3	2	3
MEM05058	Perform welds to code standards using oxy fuel gas welding process	3	3	3	2	3
MEM06001	Perform hand forging	3	2	2	2	2
MEM06002	Perform hammer forging	3	2	2	2	3
MEM06003	Carry out heat treatment	3	3	2	2	2
MEM06004	Select heat treatment processes and test finished product	3	3	2	2	2
MEM06005	Perform drop and upset forging	3	2	2	2	2
MEM06006	Repair springs	3	3	2	2	2
MEM06007	Perform basic incidental heat/quenching, tempering and annealing	2	2	2	2	2
MEM06008	Hammer forge complex shapes	3	2	2	2	3
MEM06009	Hand forge complex shapes	3	2	2	2	3
MEM07001	Perform operational maintenance of machines/equipment	2	2	2	2	2
MEM07002	Perform precision shaping/planing/slotting operations	3	3	2	2	3
MEM07003	Perform routine machine setting	2	2	2	2	2
MEM07004	Perform complex machine setting	3	3	2	2	3
MEM07005	Perform general machining	3	3	2	2	3
MEM07006	Perform lathe operations	3	3	2	2	3
MEM07007	Perform milling operations	3	3	2	2	3
MEM07008	Perform grinding operations	3	3	2	2	3
MEM07009	Perform precision jig boring operations	3	3	2	2	3
MEM07010	Perform tool and cutter grinding operations	3	3	2	2	3
MEM07011	Perform complex milling operations	3	3	2	2	3
MEM07012	Perform complex grinding operations	3	3	2	2	3
MEM07013	Perform machining operations using horizontal and vertical boring machines	3	3	2	2	3
MEM07014	Perform electro-discharge machining (EDM) operations	3	3	2	2	3
MEM07015	Set computer controlled machines and processes	3	3	2	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM07016	Set and edit computer controlled machines and processes	3	3	2	2	3
MEM07018	Write basic NC and CNC programs	3	3	3	3	3
MEM07019	Program NC and CNC machining centre	3	3	3	3	3
MEM07020	Program multiple spindle and multiple axis NC and CNC machining centre	3	3	3	3	3
MEM07021	Perform complex lathe operations	3	3	2	2	3
MEM07022	Program CNC wire cut machines	3	3	3	3	3
MEM07023	Program and set up CNC manufacturing cell	3	3	3	3	3
MEM07024	Operate and monitor machine and process	2	2	2	2	2
MEM07025	Perform advanced machine and process operation	3	2	2	2	3
MEM07026	Perform advanced plastic processing	3	2	2	2	3
MEM07027	Perform advanced press operations	3	2	2	2	3
MEM07028	Operate computer controlled machines and processes	2	2	2	2	2
MEM07029	Perform routine sharpening and maintenance of production tools and cutters	2	2	2	2	3
MEM07030	Perform basic metal spinning lathe operations	3	2	2	2	3
MEM07031	Perform complex metal spinning lathe operations	3	3	2	2	3
MEM07032	Use workshop machines for basic operations	2	2	2	2	2
MEM07033	Operate and monitor basic boiler	2	2	2	2	2
MEM07039	Write programs for industrial robots	3	3	3	3	3
MEM07040	Set multistage integrated processes	3	3	3	2	3
MEM07041	Perform production machining	2	2	2	2	3
MEM07042	Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems	3	3	3	2	3
MEM07043	Identify causes of faulty aluminium extrusions	3	3	3	2	3
MEM07044	Test a new aluminium extrusion die	3	3	3	2	3
MEM08001	Perform wire, jig and barrel load/unload work	3	2	2	2	2
MEM08002	Pre-treat work for subsequent surface coating	3	2	2	2	2

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM08003	Perform electroplating operations	3	2	2	2	2
MEM08004	Finish work using wet, dry and vapour deposition methods	3	2	2	2	2
MEM08005	Prepare and produce specialised coatings	3	2	2	2	2
MEM08006	Produce clear and/or coloured and/or sealed anodised films on aluminium	3	2	2	2	2
MEM08007	Control surface finish production and finished product quality	3	3	2	2	3
MEM08008	Operate and control surface finishing waste treatment process	3	2	2	2	2
MEM08009	Make up solutions	2	2	2	2	2
MEM08010	Manually finish/polish materials	2	2	2	2	2
MEM08011	Prepare surfaces using solvents and/or mechanical means	2	2	2	2	2
MEM08012	Prepare surfaces by abrasive blasting (basic)	2	2	2	2	2
MEM08013	Prepare surfaces by abrasive blasting (advanced)	2	2	2	2	2
MEM08014	Apply protective coatings (basic)	2	2	2	2	2
MEM08015	Apply protective coatings (advanced)	3	2	2	2	3
MEM08016	Control blast coating by-products, materials and emissions	2	2	2	2	2
MEM08018	Electroplate engineering coatings	3	3	2	2	3
MEM08019	Electroplate protective finishes	3	3	2	2	3
MEM08020	Electroplate decorative finishes	3	3	2	2	3
MEM09002	Interpret technical drawing	3	3	2	2	2
MEM09003	Prepare basic engineering drawing	3	3	2	3	3
MEM09004	Perform electrical or electronic detail drafting	3	3	2	3	3
MEM09005	Perform basic engineering detail drafting	3	3	2	3	3
MEM09006	Perform advanced engineering detail drafting	3	3	2	3	3
MEM09007	Perform advanced mechanical detail drafting	3	3	2	3	3
MEM09008	Perform advanced structural detail drafting	3	3	2	3	3
MEM09009	Create 2-D drawings using computer-aided design system	3	3	2	3	4

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM09010	Create 3-D models using computer-aided design system	3	3	2	3	4
MEM09011	Apply basic engineering design concepts	3	3	2	3	3
MEM09021	Interpret and produce drawings of curved 3-D shapes	3	3	2	3	4
MEM09022	Create 2-D code files using computer-aided manufacturing system	3	3	2	3	4
MEM09023	Create 3-D code files using computer-aided manufacturing system	3	3	2	3	4
MEM10001	Erect structures	3	3	2	2	3
MEM10002	Terminate and connect electrical wiring	3	3	2	2	3
MEM10003	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	3	3	3	3	3
MEM10004	Enter and change programmable controller operational parameters	3	3	2	2	3
MEM10005	Commission programmable controller programs	3	3	3	2	3
MEM10006	Install machine/plant	3	3	2	2	3
MEM10007	Modify control systems	3	3	3	3	3
MEM10008	Undertake commissioning procedures for plant and/or equipment	3	3	3	3	3
MEM10009	Install refrigeration and air conditioning plant and equipment	3	3	3	2	3
MEM10010	Install pipework and pipework assemblies	3	2	2	2	3
MEM10011	Terminate and connect specialist cables	3	3	2	2	3
MEM10013	Install split air conditioning systems and associated pipework	3	2	2	2	3
MEM11001	Erect/dismantle scaffolding and equipment	2	2	2	2	2
MEM11002	Erect/dismantle intermediate scaffolding and equipment	2	2	2	2	2
MEM11003	Coordinate erection/dismantling of complex scaffolding/equipment	2	2	2	2	2
MEM11004	Undertake dogging	2	2	2	2	2
MEM11005	Pick and process order	2	2	2	2	2
MEM11006	Perform production packaging	2	2	2	2	2
MEM11007	Administer inventory procedures	2	2	2	2	2

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM11008	Package materials (stores and warehouse)	2	2	2	2	2
MEM11009	Handle/move bulk fluids/gases	2	2	2	2	2
MEM11010	Operate mobile load shifting equipment	2	2	2	2	2
MEM11011	Undertake manual handling	2	2	2	2	2
MEM11012	Purchase materials	2	2	2	3	2
MEM11013	Undertake warehouse receival process	2	2	2	2	2
MEM11014	Undertake warehouse dispatch process	2	2	2	2	2
MEM11015	Manage warehouse inventory system	3	3	3	3	2
MEM11016	Order materials	2	2	2	2	2
MEM11017	Organise and lead stocktakes	3	3	3	3	2
MEM11018	Organise and maintain warehouse stock receival and dispatch system	3	3	3	3	2
MEM11019	Undertake tool store procedures	2	2	2	2	2
MEM11020	Perform advanced warehouse computer operations	3	3	3	3	3
MEM11021	Perform advanced operation of load shifting equipment	2	2	2	2	2
MEM11022	Operate fixed/moveable load shifting equipment	2	2	2	2	2
MEM11023	Operate a bridge and gantry crane	2	2	2	2	2
MEM11024	Undertake basic rigging	2	2	2	2	2
MEM11025	Operate a non-slewing mobile crane of greater than three tonnes capacity	2	2	2	2	2
MEM12001	Use comparison and basic measuring devices	2	2	2	2	2
MEM12002	Perform electrical/electronic measurement	3	2	2	2	3
MEM12003	Perform precision mechanical measurement	3	2	2	2	3
MEM12004	Perform precision electrical/electronic measurement	3	3	2	2	3
MEM12005	Calibrate measuring equipment	3	3	3	2	3
MEM12006	Mark off/out (general engineering)	3	2	2	2	3
MEM12007	Mark off/out structural fabrications and shapes	3	2	2	2	3
MEM12019	Measure components using coordinate measuring machines	3	3	2	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM12020	Set and operate coordinate measuring machines	3	3	2	2	3
MEM12021	Program coordinate measuring machines	3	3	3	2	3
MEM12022	Program coordinate measuring machines (advanced)	3	3	3	2	4
MEM12023	Perform engineering measurements	3	2	2	2	3
MEM12024	Perform computations	3	2	2	2	3
MEM12025	Use graphical techniques and perform simple statistical computations	4	3	3	3	4
MEM12026	Perform advanced trade calculations in a manufacturing, engineering or related environment	4	3	3	3	4
MEM13001	Perform emergency first aid	2	2	2	2	2
MEM13002	Undertake work health and safety activities in the workplace	3	3	3	3	2
MEM13003	Work safely with industrial chemicals and materials	3	3	3	3	2
MEM13004	Work safely with molten metals/glass	3	3	3	3	2
MEM13006	Collect and evaluate work health and safety data for an enterprise or section of an enterprise	3	3	3	3	2
MEM13007	Maintain water treatment systems for cooling towers	2	2	2	2	2
MEM13010	Supervise work health and safety in an industrial work environment	3	3	3	3	2
MEM13013	Work safely with ionizing radiation	3	3	3	3	3
MEM13015	Work safely and effectively in manufacturing and engineering	2	2	2	2	1
MEM14001	Schedule material deliveries	3	3	3	3	3
MEM14002	Undertake basic process planning	3	3	3	3	3
MEM14003	Undertake production scheduling	3	3	3	3	3
MEM14006	Plan work activities	2	2	2	2	2
MEM15001	Perform basic statistical quality control	3	3	2	2	3
MEM15003	Use improvement processes in team activities	3	2	2	2	2
MEM15004	Perform inspection	3	2	2	2	2
MEM15005	Select and control inspection processes and procedures	2	3	3	2	2
MEM15007	Conduct product and/or process capability studies	3	3	3	3	4



Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM15008	Perform advanced statistical quality control	3	3	3	3	4
MEM15010	Perform laboratory procedures	4	3	3	3	4
MEM15011	Exercise external quality assurance	3	3	2	2	3
MEM15012	Maintain/supervise the application of quality procedures	3	3	3	3	4
MEM16001	Give formal presentations and take part in meetings	3	3	3	3	3
MEM16002	Conduct formal interviews and negotiations	3	3	3	3	2
MEM16003	Provide advanced customer service	3	3	3	3	2
MEM16004	Perform internal/external customer service	2	2	2	3	2
MEM16005	Operate as a team member to conduct manufacturing, engineering or related activities	2	2	2	2	2
MEM16006	Organise and communicate information	2	2	2	2	2
MEM16008	Interact with computing technology	3	3	2	2	3
MEM16009	Research and analyse engineering information	4	4	4	4	3
MEM16010	Write reports	4	4	4	3	4
MEM16011	Communicate with individuals and small groups	3	3	3	4	2
MEM16012	Interpret technical specifications and manuals	4	4	3	4	3
MEM16013	Operate in a self-directed team	3	3	3	4	3
MEM16014	Report technical information	4	4	4	3	3
MEM17001	Assist in development and deliver training in the workplace	3	3	3	3	3
MEM17002	Conduct workplace assessment	3	3	3	3	3
MEM17003	Assist in the provision of on-the-job training	2	2	2	3	2
MEM18001	Use hand tools	2	2	2	2	2
MEM18002	Use power tools/hand held operations	2	2	2	2	2
MEM18003	Use tools for precision work	3	2	2	2	3
MEM18004	Maintain and overhaul mechanical equipment	3	3	3	2	3
MEM18005	Perform fault diagnosis, installation and removal of bearings	3	3	3	2	3
MEM18006	Perform precision fitting of engineering components	3	3	3	2	3
MEM18007	Maintain and repair mechanical drives and	3	3	3	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
	mechanical transmission assemblies					
MEM18008	Balance equipment	3	3	3	2	3
MEM18009	Perform precision levelling and alignment of machines and engineering components	3	3	3	2	3
MEM18010	Perform equipment condition monitoring and recording	3	3	3	2	3
MEM18011	Shut down and isolate machines/equipment	3	3	2	2	2
MEM18012	Perform installation and removal of mechanical seals	3	3	3	2	3
MEM18013	Perform gland packing	3	3	2	2	3
MEM18014	Manufacture press tools and gauges	3	3	3	3	4
MEM18015	Maintain tools and dies	3	3	3	3	3
MEM18016	Analyse plant and equipment condition monitoring results	4	3	3	3	4
MEM18017	Modify mechanical systems and equipment	4	3	3	3	4
MEM18018	Maintain pneumatic system components	3	3	2	2	3
MEM18019	Maintain pneumatic systems	3	3	3	3	3
MEM18020	Maintain hydraulic system components	3	3	2	2	3
MEM18021	Maintain hydraulic systems	3	3	3	3	3
MEM18022	Maintain fluid power controls	3	3	3	3	3
MEM18023	Modify fluid power system operation	3	3	3	3	3
MEM18045	Fault find and repair electrical equipment/ components up to 250 volts single phase supply	3	3	2	2	3
MEM18046	Fault find and repair electrical equipment/ components up to 1000 volts a.c./1500 volts d.c.	3	3	2	2	3
MEM18048	Fault find and repair/rectify basic electrical circuits	3	3	2	2	3
MEM18049	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3	3	2	2	3
MEM18050	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	3	3	2	2	3
MEM18051	Fault find and repair/rectify complex electrical circuits	3	3	2	2	3
MEM18053	Modify fluid power control systems	3	3	3	3	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM18054	Fault find, test and calibrate instrumentation systems and equipment	3	3	3	3	3
MEM18055	Dismantle, replace and assemble engineering components	3	3	2	2	3
MEM18056	Diagnose and repair analog equipment and components	4	4	3	3	3
MEM18057	Maintain/service analog/digital electronic equipment	3	3	3	3	3
MEM18058	Modify electronic equipment	4	4	3	3	3
MEM18059	Modify electronic systems	4	4	3	3	3
MEM18060	Maintain, repair control instrumentation - single and multiple loop control systems	4	4	3	3	4
MEM18061	Maintain/calibrate complex control systems	4	4	3	3	4
MEM18062	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	4	4	3	3	3
MEM18063	Terminate signal and data cables	3	3	2	2	3
MEM18064	Maintain instrumentation system components	3	3	3	3	3
MEM18065	Diagnose and repair digital equipment and components	4	4	3	3	3
MEM18066	Diagnose and repair microprocessor-based equipment	4	4	3	3	4
MEM18067	Tune control loops - multi controller or multi element systems	4	4	3	3	4
MEM18069	Maintain, repair instrumentation process control analysers	4	4	3	3	3
MEM18071	Connect and disconnect fluid conveying system components	3	3	2	2	3
MEM18072	Manufacture fluid conveying conductor assemblies	3	3	2	2	3
MEM18083	Handle fluorocarbon refrigerants according to regulations	3	3	2	2	2
MEM18084	Commission and decommission split air conditioning systems	3	3	2	2	3
MEM18085	Install, service and repair domestic air conditioning and refrigeration appliances	3	3	2	2	3
MEM18086	Test, recover, evacuate and charge refrigeration systems	3	3	2	2	2
MEM18087	Service and repair domestic and light commercial	3	3	2	2	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
	refrigeration and air conditioning equipment					
MEM18088	Maintain and repair commercial air conditioning systems and components	3	3	2	2	3
MEM18089	Maintain and repair central air handling systems	3	3	2	2	3
MEM18090	Maintain and repair industrial refrigeration systems and components	3	3	2	2	3
MEM18091	Maintain and repair multistage, cascade and/or ultra-cold industrial refrigeration systems	3	3	2	2	3
MEM18092	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	3	3	2	2	3
MEM18093	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	3	3	2	2	3
MEM18094	Service and repair commercial refrigeration	3	3	2	2	3
MEM18095	Maintain and repair cooling towers/evaporative condensers and associated equipment	3	3	2	2	3
MEM18096	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	3	3	2	2	3
MEM18097	Manufacture cavity dies	3	3	3	3	4
MEM18098	Prepare to perform work associated with fuel system installation and servicing	3	3	2	2	2
MEM19001	Perform jewellery metal casting	2	2	2	2	2
MEM19002	Prepare jewellery illustrations	2	2	2	2	2
MEM19003	Handle gem materials	2	2	2	2	2
MEM19004	Handle and examine gemstone materials	2	2	2	2	2
MEM19005	Produce three-dimensional precision items	3	3	2	3	3
MEM19006	Replace watch batteries	2	2	2	2	2
MEM19007	Perform gemstone setting	3	2	2	2	3
MEM19008	Prepare jewellery designs	3	3	3	3	3
MEM19009	Perform investment procedures for lost wax casting process	3	2	2	2	3
MEM19010	Produce rubber moulds for lost wax casting process	3	2	2	2	2

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM19011	Perform wax injection of moulds for lost wax casting process	3	2	2	2	2
MEM19012	Produce jewellery wax model	3	2	2	2	2
MEM19013	Produce jewellery metal masters	3	3	2	2	3
MEM19014	Perform hand engraving	2	2	2	2	2
MEM19015	Perform jewellery enamelling	3	2	2	2	2
MEM19016	Construct jewellery components	3	2	2	2	3
MEM19017	Fabricate jewellery items	3	2	2	2	3
MEM19018	Repair jewellery items	3	3	3	3	3
MEM19020	Fault find and maintain micro-mechanisms	3	3	3	3	3
MEM19021	Diagnose and service micro-mechanisms	3	3	3	3	3
MEM19022	Perform precision micro-mechanism diagnosis and servicing	3	3	3	3	3
MEM20001	Produce keys	3	3	2	2	3
MEM20002	Assemble and test lock mechanisms	3	3	2	2	3
MEM20003	Install and upgrade locks and hardware	3	3	3	2	3
MEM20004	Gain entry	3	3	2	3	3
MEM20005	Install and maintain door control devices/systems	3	3	2	3	3
MEM20006	Maintain and service mechanical locking devices	3	3	2	3	3
MEM20007	Plan and prepare a masterkey system	3	3	2	3	3
MEM20008	Develop and implement a masterkey system	3	3	2	3	3
MEM20009	Gain entry and reinstate fire and security containers	3	3	2	3	3
MEM20010	Gain entry and reinstate automotive locking systems	3	3	2	3	3
MEM20011	Service and repair fire and security containers	3	3	2	3	3
MEM20012	Service and repair mechanical automotive locking systems	3	3	2	3	3
MEM20013	Service automotive transponder systems	3	3	2	3	3
MEM20014	Perform a site security survey	3	3	3	3	2
MEM21001	Replace watch batteries, capacitors and bands	2	2	2	2	2
MEM21002	Perform watch movement exchange	2	2	2	2	2
MEM21003	Perform watch case servicing, repair and refurbishment	2	2	2	2	2

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM21004	Clean watch and clock components	2	2	2	2	2
MEM21005	Diagnose faults in quartz watches	3	3	2	3	2
MEM21006	Service quartz watches	2	2	2	2	2
MEM21007	Service complex quartz watches	3	3	2	2	2
MEM21008	Service mechanical watches	3	3	2	2	2
MEM21009	Inspect, diagnose, adjust and repair mechanical watches	3	3	2	2	2
MEM21010	Service watch power generating systems	3	3	2	2	2
MEM21011	Service calendar and other dial indication mechanisms for watches	3	3	2	2	2
MEM21012	Service and repair mechanical watch oscillating systems	3	3	2	2	2
MEM21013	Service, test and adjust watch escapements	3	3	2	2	2
MEM21014	Service mechanical chronograph watches	3	3	2	2	2
MEM21015	Perform precision watch timing and adjustment	3	3	2	2	2
MEM21016	Install and set up clocks	3	3	2	3	2
MEM21017	Service and repair clock timepieces	3	3	2	2	2
MEM21018	Service clock escapements and oscillating systems	3	3	2	2	2
MEM21019	Service and repair clock striking mechanisms	3	3	2	2	2
MEM21020	Service and repair clock chiming mechanisms	3	3	2	2	2
MEM21021	Restore clockwork mechanisms	3	3	3	3	3
MEM21022	Manufacture watch and clock components	3	3	3	3	3
MEM21023	Plan, set up and operate horological workshop or service centre	3	3	3	3	3
MEM25001	Apply fibre-reinforced materials	2	2	2	2	2
MEM25002	Form and integrate fibre-reinforced structures	2	2	2	2	2
MEM25003	Set up marine vessel structures	3	3	2	2	3
MEM25004	Fair and shape surfaces	3	3	2	2	3
MEM25005	Construct and assemble marine vessel timber components	3	3	2	2	3
MEM25006	Undertake marine sheathing operations	3	3	2	2	3
MEM25007	Maintain marine vessel surfaces	2	2	2	2	2

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM25008	Repair marine vessel surfaces and structures	3	3	2	2	3
MEM25009	Form timber shapes using hot processes	3	3	2	2	3
MEM25010	Perform fitout procedures	3	3	2	2	3
MEM25011	Install marine systems	3	3	2	2	3
MEM25012	Install and test operations of marine auxiliary systems	3	3	2	2	3
MEM25013	Produce three-dimensional plugs/moulds	3	3	2	2	3
MEM25014	Perform marine slipping operations	3	3	2	2	3
MEM25015	Assemble and install equipment and accessories/ancillaries	3	3	2	2	3
MEM26001	Lay up composites using open moulding techniques	3	2	2	2	2
MEM26002	Lay up composites using vacuum closed moulding techniques	3	3	2	2	2
MEM26003	Lay up composites using pressure closed moulding techniques	3	3	2	2	2
MEM26004	Make basic plugs for composites fabrication	3	3	2	2	3
MEM26005	Make basic moulds for composites fabrication	3	2	2	2	3
MEM26006	Mark and cut out sheets for composite use	3	3	2	2	3
MEM26007	Select and use reinforcing appropriate for product	3	3	2	2	3
MEM26008	Select and use resin systems appropriate for product	3	3	2	2	3
MEM26009	Select and use cores and fillers appropriate for product	3	3	2	2	3
MEM26010	Store and handle composite materials	3	3	2	2	2
MEM26011	Determine materials and techniques for a composite component or product	3	3	2	2	3
MEM26012	Record and trial work processes for one-off composite products	3	3	3	3	3
MEM26013	Select and use composite processes or systems appropriate for product	3	3	2	2	3
MEM26014	Adjust resin chemicals for current conditions	3	3	2	2	3
MEM26015	Select and apply repair techniques	3	3	2	2	3
MEM26016	Select and use joining techniques	3	3	2	2	3
MEM26017	Prepare composite or other substrate surfaces	3	3	2	2	3
MEM26018	Organise composite trials	3	3	3	3	3

Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM26019	Finish a composite product	3	3	2	2	3
MEM26020	Identify and interpret required standards for composites	3	3	2	2	3
MEM27001	Maintain and repair stationary and mobile plant engine cooling systems	3	3	2	2	3
MEM27002	Test and repair compression ignition systems	3	3	2	2	3
MEM27003	Overhaul engine fuel system components	3	3	2	2	3
MEM27004	Maintain and repair engine lubrication systems	3	3	2	2	3
MEM27005	Tune diesel engines	3	3	2	2	3
MEM27006	Diagnose and rectify batteries, low voltage sensors and circuits	3	3	2	2	3
MEM27007	Diagnose and rectify low voltage starting systems	3	3	2	2	3
MEM27008	Maintain induction, exhaust and emission control systems	3	3	2	2	3
MEM27009	Diagnose and rectify braking systems	3	3	2	2	3
MEM27010	Diagnose and rectify low voltage charging systems	3	3	2	2	3
MEM27011	Maintain track type undercarriage on mobile plant	3	3	2	2	3
MEM27012	Maintain mobile plant suspension systems	3	3	2	2	3
MEM27013	Maintain steering systems	3	3	2	2	3
MEM27014	Diagnose and rectify automatic transmissions	3	3	2	2	3
MEM27015	Maintain and rectify drive line and final drives	3	3	2	2	3
MEM27016	Diagnose and maintain electronic controlling systems on mobile and stationary plant	3	3	2	2	3
MEM27017	Maintain, fault find and rectify hydraulic systems for mobile plant	3	3	2	2	3
MEM27018	Test, diagnose and rectify mobile and stationary plant external monitoring and control systems	3	3	3	3	3
MEM27019	Diagnose, repair and replace diesel engines in stationary and mobile plant	3	3	2	2	3
MEM27020	Apply knowledge of large combustion engine operations to service and maintenance tasks	3	3	2	2	2



Unit code	Unit title	Learning	Reading	Writing	Oral Communication	Numeracy
MEM27021	Maintain, fault find and repair stationary plant gas turbine engines	3	3	2	2	3
MEM27022	Maintain, fault find and repair traction drive mechanics	3	3	2	2	3
MEM27023	Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment	3	3	3	3	3
MEM27024	Diagnose and rectify mobile plant hydrostatic systems	3	3	2	2	3
MEM27025	Maintain, diagnose and rectify fluid power controls in mobile equipment	3	3	2	2	3
MEM27026	Service and repair mobile plant air conditioning systems	3	3	2	2	3
MEM27027	Install or modify mobile plant air conditioning systems	3	3	2	2	3
MEM27028	Diagnose and rectify manual transmissions	3	3	2	2	2
MEM27029	Maintain wheels and tyres	2	2	2	2	2
MEM27030	Perform engine bottom-end overhaul	3	3	2	2	3
MEM27031	Perform engine top-end overhaul	3	3	2	2	3
MEM27032	Service combustion engines	3	3	2	2	2
MEM27033	Perform advanced equipment testing and diagnostics on mobile plant and equipment	3	3	3	3	3
MEM50001	Classify recreational boating technologies and features	2	2	2	2	2
MEM50002	Work safely on marine craft	2	2	2	2	2
MEM50003	Follow work procedures to maintain the marine environment	2	2	2	2	2
MEM50004	Maintain quality of environment by following marina codes	2	2	2	2	2
MEM50005	Refuel vessels	2	2	2	2	2
MEM50006	Check operational capability of marine craft	2	2	2	2	2
MEM50007	Check operational capability of sails and sail operating equipment	2	2	2	2	2
MEM50008	Carry out trip preparation and planning	2	2	2	2	2
MEM50009	Safely operate a mechanically powered recreational boat	2	2	2	2	2
MEM50010	Respond to boating emergencies and incidents	2	2	2	2	2

## Health and safety implications for manufacturing

The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include the following:

- Work health and safety (WHS) legislation, codes of practice and guidance material
- Australian Design Rules (ADR)
- Environmental regulations and guidelines
- Other relevant government legislation, regulations and codes
- Australian and other standards
- Other relevant codes and standards
- Licence and certification requirements.

The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.

All operations must comply with WHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time. Individual units of competency give details on the relevant WHS requirements.

All operations must also comply with duty of care obligations as described in state/territory or federal legislation - these requirements must not be compromised at any time.

### ***Industrial electricians***

All Commonwealth and, where applicable, state and territory WHS legislation and regulations apply to industrial electrical work. Specific aspects of the work require great care and these areas are emphasised in the relevant units of competency. Examples of such areas include:

- All 32 ERAC 'critical' capabilities
- Testing or measuring circuits or equipment in existing installations when live
- Isolation and tag procedures and proving electrical isolation
- Switching, isolating, commissioning and decommissioning high voltage (HV) and low voltage (LV) electrical equipment and installations
- Hazards associated with step and touch voltages, induced voltages and stored energy particularly with high voltages in single and three phase transformers
- Creepage and clearance requirements associated with HV equipment and distribution systems
- Earthing requirements to limit the rise of touch voltages
- Safe working procedures for connecting and testing and fault-finding transformers
- WHS precautions and considerations when dealing with instrument transformers especially current transformers
- Live switchboard rescue from live low voltage conductors
- Risks associated with fallen distribution lines and the associated voltage gradients
- Installation defects categorised as 'serious' by electrical regulators
- Drilling materials containing asbestos including undertaking a risk assessment and applicable use of personal protective equipment (PPE)
- sources of stored energy associated with machine/system/process control
- Installation and maintenance work in hazardous areas
- Risks associated with lifting of heavy loads
- Working in confined spaces
- Working at heights.

## Resources and equipment

Registered Training Organisations (RTOs) delivering units of competency in the MEM Manufacturing and Engineering Training Package must comply with the assessment requirements in each unit of competency that includes access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications. See examples of qualifications below where specific resources and equipment are required:

### ***MEM20219 Certificate II in Engineering – Production Technology***

Completion of this qualification with the appropriate competencies for commissioning/decommissioning of split air conditioning systems would enable the qualified person to apply for an Australian Refrigeration Council (ARC) Refrigerant Handling Licence for Split Systems. The resources and equipment that RTOs intending to deliver the qualification must have access to includes the following:

- Applicable tools, equipment and testing devices including refrigeration gauge manifold, assorted valves and couplings, temperature measuring devices, vacuum measuring gauges, scales, refrigerant recovery unit, vacuum pump and leak detectors
- Refrigerant containers/cylinders
- Procedures for working with R32 and other flammable refrigerants where used in split air conditioning systems
- Access to single head systems up to 18kw cooling capacity
- Legislative and industry requirements for split systems.

### ***MEM31219 Certificate III in Engineering – Industrial Electrician***

While some units of competency permit assessment under simulated conditions the range of resources and equipment required means that assessment off the job is impractical for most units associated with industrial electrician activities. RTOs intending to add this new qualification to their scope should carefully consider how they might acquire suitable plant and equipment to provide valid learning experiences for students.

Resources and equipment used for assessment should reflect current industry practices in relation to:

- Installing wiring and accessories for low voltage circuits including supplying a three phase load in general and industrial installations
- Working examples of three phase loads
- Realistic examples of faults in wiring, lighting and equipment that occur within the industrial electrician's spectrum of work
- Test equipment and appropriate hand and power tools
- Commission and decommissioning of high and low voltage equipment and installations
- HV test equipment and switching arrangements
- Performing installation and maintenance work on electrical equipment in hazardous areas.

## Legal considerations for learners

Apprenticeship legal requirements are determined by the appropriate state/territory authority or commission. This includes form and registration of the Training Contract and Training Plan.

Current legislation and successor legislation is defined in:

- Australian Capital Territory: Training and Tertiary Education Act 2003
- New South Wales: Apprenticeship and Traineeship Act 2001
- Northern Territory: Northern Territory Employment and Training Act 1991
- Queensland: Vocational Education, Training and Employment Act 2000
- South Australia: Training and Skills Development Act 2008
- Tasmania: Vocational Education and Training Act 1994

- Victoria: Education and Training Reform Act 2006
- Western Australia: Vocational Education and Training Act 1996

Under Awards employers must ensure that each apprentice has appropriate arrangements made at an enterprise level to meet the apprentices' training requirements and adequate access to suitably qualified people to supervise the learning and assessment of the apprentice. Awards stipulate payment levels for first, second, third and fourth stages of the apprenticeship and any work and pay conditions applying to apprentices willing to work overtime or on public holidays, which usually has set limits.

The term of an apprenticeship is determined by the rate by which an apprentice gains the required competence and the starting level of competence of the apprentice. For the trades covered by the MEM Manufacturing and Engineering Training Package three to four years is a general guide.

## Assessment principles

### Use of assessment tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgments about whether candidates have achieved competency. There is no set format or process for the design, production or development of assessment tools.

### Using prepared assessment tools

If using prepared assessment tools, assessors should ensure these relate to the current version of the relevant unit of competency. The current unit of competency can be checked on <http://training.gov.au>.

### Developing assessment tools

When developing assessment tools, assessors must ensure that they:

- Are benchmarked against the relevant unit or units of competency
- Meet the assessment requirements of the National VET Regulator as set out in the *Standards for Registered Training Organisations (RTOs) 2015*.

Key references for assessors developing assessment tools:

- TAE Training and Education Training Package
- ASQA's Guide to developing assessment tools.

## Principles of assessment

All assessments of competency against the MEM Manufacturing and Engineering Training Package carried out by RTOs are required to demonstrate compliance with the principles of assessment:

- Fairness
- Flexibility
- Validity
- Reliability.

These principles must be addressed in the:

- Design, establishment and management of the assessment system for this Training Package
- Development of assessment tools, and the conduct of assessment.

### Fairness

The individual learner's needs are considered in the assessment process.

Where appropriate, reasonable adjustments are applied by the RTO to take into account the individual learner's needs.

The RTO informs the learner about the assessment process and provides the learner with the opportunity to challenge the result of the assessment and be reassessed if necessary.

### Flexibility

Assessment is flexible to the individual learner by:

- Reflecting the learner's needs

- Assessing competencies held by the learner no matter how or where they have been acquired
- Drawing from a range of assessment methods and using those that are appropriate to the context, the unit of competency and associated assessment requirements, and the individual.

### **Validity**

Any assessment decision of the RTO is justified, based on the evidence of performance of the individual learner.

Validity requires:

- Assessment against the unit/s of competency and the associated assessment requirements covers the broad range of skills and knowledge that are essential to competent performance
- Assessment of knowledge and skills is integrated with their practical application
- Assessment to be based on evidence that demonstrates that a learner could demonstrate these skills and knowledge in other similar situations
- Judgement of competence is based on evidence of learner performance that is aligned to the unit/s of competency and associated assessment requirements.

### **Reliability**

Evidence presented for assessment is consistently interpreted and assessment results are comparable irrespective of the assessor conducting the assessment.

Source: Standards for RTOs 2015, 20 October 2014.

### **Rules of evidence**

#### **Validity**

The assessor is assured that the learner has the skills, knowledge and attributes as described in the module or unit of competency and associated assessment requirements.

#### **Sufficiency**

The assessor is assured that the quality, quantity and relevance of the assessment evidence enables a judgement to be made of a learner's competency.

#### **Authenticity**

The assessor is assured that the evidence presented for assessment is the learner's own work.

#### **Currency**

The assessor is assured that the assessment evidence demonstrates current competency. This requires the assessment evidence to be from the present or the very recent past.

(Source: Standards for RTOs 2015, 20 October 2014)

### **Standards for RTOs**

The **Standards for RTOs 2015** replace the former AQTF Standards for NVR RTOs 2012 and are now the standards guiding nationally consistent, high-quality training and assessment services in the vocational education and training (VET) system. Download the Standards from the **Australian Skills Quality Authority (ASQA)** website at <http://www.asqa.gov.au/>.

#### **Assessor requirements of the Standards for RTOs 2015**

Assessors must satisfy the assessor requirements in the *Standards for RTOs 2015* and comply with the *National Vocational Education and Training Regulator Act 2011* or equivalent legislation covering VET regulation in a non-referring State as the case requires.

**Australian Qualifications Framework (AQF)**

Each RTO must issue AQF qualifications and Statements of Attainment that meet the requirements of the current *AQF Implementation Handbook (Second Edition, January 2013)* and the endorsed Training Packages within the scope of its registration. An AQF qualification is issued once the full requirements for a qualification, as specified in the nationally endorsed Training Package are met. A Statement of Attainment is issued when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). See the current edition of the *AQF Implementation Handbook* available on the AQF Council website [www.aqf.edu.au](http://www.aqf.edu.au).

## Useful links

### General links

Australian Qualifications Framework: First edition, July 2011: [www.aqf.edu.au/](http://www.aqf.edu.au/)

TGA website, training packages: [www.training.gov.au](http://www.training.gov.au)

IBSA website: [www.ibsa.org.au/ibsa-manufacturing](http://www.ibsa.org.au/ibsa-manufacturing)

Department of Education and Training: <https://www.education.gov.au/>

Australian Skills Quality Authority (ASQA): <http://www.asqa.gov.au/>

Victorian Registration and Qualifications Authority: <http://www.vrqa.vic.gov.au>

Training Accreditation Council, WA: <http://www.tac.wa.gov.au>

The Australian Apprenticeships site: [www.australianapprenticeships.gov.au](http://www.australianapprenticeships.gov.au) offers information about traineeships and apprenticeships and includes links to state and territory authorities (STAs) that monitor provision.

### State Training Authorities

Australian Capital Territory: <http://www.det.act.gov.au/home>

New South Wales: <https://www.det.nsw.edu.au>

Northern Territory: <http://www.det.nt.gov.au>

Queensland: <http://training.qld.gov.au>

South Australia: <http://www.statedevelopment.sa.gov.au/>

Tasmania: <http://www.education.tas.gov.au>

Victoria: <http://www.education.vic.gov.au>

Western Australia: <http://biggerpicture.education.wa.edu.au/>

LiteracyNet – key information about Australian adult literacy activities and links to a range of program, professional development, resource and research sites:

<http://www.deewr.gov.au/skills/programs/litandnum/literacynet/Pages/default.aspx>

National Foundation Skills Strategy for Adults:

<http://www.deewr.gov.au/Skills/Overview/Policy/NFSS/Pages/NFSSforAdults.aspx>

### Further advice may be obtained from:



#### Innovation and Business Skills Australia

Level 11, 176 Wellington Parade  
East Melbourne VIC 3002

T: +61 3 9815 7099

F: +61 3 9815 7001

E: [manufacturing@ibsa.org.au](mailto:manufacturing@ibsa.org.au)

W: [www.ibsa.org.au/ibsa-manufacturing](http://www.ibsa.org.au/ibsa-manufacturing)

## Appendix 1: Mapping – MEM Release 2.0 to MEM05

### MEM05 Qualifications – mapping to MEM Release 2.0 Qualifications

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM10105	Certificate I in Engineering	MEM10119	Certificate I in Engineering	Release 1. Supersedes MEM10105 but is not equivalent.
MEM20205	Certificate II in Engineering - Production Technology	MEM20219	Certificate II in Engineering - Production Technology	Release 1. Reformatted – equivalent.
MEM30105	Certificate III in Engineering - Production Systems	MEM30119	Certificate III in Engineering - Production Systems	Release 1. Reformatted – equivalent.
MEM30205	Certificate III in Engineering - Mechanical Trade	MEM30219	Certificate III in Engineering - Mechanical Trade	Release 1. Reformatted – equivalent.
MEM30305	Certificate III in Engineering - Fabrication Trade	MEM30319	Certificate III in Engineering - Fabrication Trade	Release 1. Reformatted – equivalent.
MEM30605	Certificate III in Jewellery Manufacture	MEM30619	Certificate III in Jewellery Manufacture	Release 1. Reformatted – equivalent.
MEM30705	Certificate III in Marine Craft Construction	MEM30719	Certificate III in Marine Craft Construction	Release 1. Reformatted – equivalent.
MEM30805	Certificate III in Locksmithing	MEM30819	Certificate III in Locksmithing	Release 1. Reformatted – equivalent.
MEM30905	Certificate III in Boating Services	MEM30919	Certificate III in Boating Services	Release 1. Reformatted – equivalent.
MEM31010	Certificate III in Watch and Clock Service and Repair	MEM31019	Certificate III in Watch and Clock Service and Repair	Release 1. Reformatted – equivalent.
MEM31112	Certificate III in Engineering - Composites Trade	MEM31119	Certificate III in Engineering - Composites Trade	Release 1. Reformatted – equivalent.
MEM30205	Certificate III in Engineering - Mechanical Trade (Refrigeration and Air Conditioning)	MEM31319	Certificate III in Refrigeration and Air Conditioning	Release 1. New qualification. Supersedes MEM30205 but is not equivalent.
MEM30205	Certificate III in Engineering - Mechanical Trade (Fixed and Mobile Plant Mechanic)	MEM31419	Certificate III in Engineering – Fixed and Mobile Plant Mechanic	Release 1. New qualification. Supersedes



MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
				MEM30205 but is not equivalent.
MEM30205	Certificate III in Engineering - Mechanical Trade (Toolmaking Trade)	MEM31519	Certificate III in Engineering – Toolmaking Trade	Release 1. New qualification. Supersedes MEM30205 but is not equivalent.
MEM30305	Certificate III in Engineering - Fabrication Trade (Casting and Moulding Trade)	MEM31719	Certificate III in Engineering – Casting and Moulding Trade	Release 1. New qualification. Supersedes MEM30305 but is not equivalent.
MEM40105	Certificate IV in Engineering	MEM40119	Certificate IV in Engineering	Release 1. Reformatted – equivalent.
MEM50105	Diploma of Engineering - Advanced Trade	MEM50119	Diploma of Engineering - Advanced Trade	Release 1. Reformatted – equivalent.

#### MEM Qualification – mapping to MEM Release 2.0 Qualifications

MEM Release 1.2		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM31215	Certificate III in Engineering – Industrial Electrician	MEM31219	Certificate III in Engineering – Industrial Electrician	Release 1. Supersedes and is equivalent to MEM31215

## MEM05 Units of Competency - mapping to MEM Release 2.0 Units of Competency

Code	MEM05 Release 11.1 Title	Code	MEM Release 2.0 Title	Comment / Equivalence
MEM03001B	Perform manual production assembly	MEM03001	Perform manual production assembly	New format. Equivalent
MEM03002B	Perform precision assembly	MEM03002	Perform precision assembly	New format. Equivalent
MEM03003B	Perform sheet and plate assembly	MEM03003	Perform sheet and plate assembly	New format. Equivalent
MEM03004B	Perform electronic/electrical assembly (production)	MEM03004	Perform electronic/electrical assembly (production)	New format. Equivalent
MEM03005B	Rework and repair (electrical/electronic production)	MEM03005	Rework and repair (electrical/electronic production)	New format. Equivalent
MEM03006B	Set assembly stations	MEM03006	Set assembly stations	New format. Equivalent
MEM04001B	Operate melting furnaces	MEM04001	Operate melting furnaces	New format. Equivalent
MEM04002B	Perform gravity die casting	MEM04002	Perform gravity die casting	New format. Equivalent
MEM04003B	Operate pressure die casting machine	MEM04003	Operate pressure die casting machine	New format. Equivalent
MEM04004B	Prepare and mix sand for metal moulding	MEM04004	Prepare and mix sand for metal moulding	New format. Equivalent
MEM04005C	Produce moulds and cores by hand (jobbing)			Superseded by MEM04024 and MEM04025
MEM04006B	Operate sand moulding and core making machines	MEM04006	Operate sand moulding and core making machines	New format. Equivalent
MEM04007B	Pour molten metal	MEM04007	Pour molten metal	New format. Equivalent
MEM04008B	Fettle and trim metal castings/forgings	MEM04008	Fettle and trim metal castings/forgings	New format. Equivalent
MEM04010B	Develop and manufacture wood patterns	MEM04010	Develop and manufacture wood patterns	New format. Equivalent
MEM04011B	Produce polymer patterns	MEM04011	Produce polymer patterns	New format. Equivalent
MEM04012B	Assemble plated patterns	MEM04012	Assemble plated patterns	New format. Equivalent
MEM04013B	Develop and manufacture polystyrene patterns	MEM04013	Develop and manufacture polystyrene patterns	New format. Equivalent
MEM04014B	Develop and manufacture production patterns	MEM04014	Develop and manufacture production patterns	New format. Equivalent
MEM04015B	Develop and manufacture vacuum forming moulds and associated equipment	MEM04015	Develop and manufacture vacuum forming moulds and associated equipment	New format. Equivalent
MEM04016C	Develop and manufacture precision models	MEM04016	Develop and manufacture precision models	New format. Equivalent
MEM04017B	Develop and manufacture gear, conveyor screw and propeller patterns	MEM04017	Develop and manufacture gear, conveyor screw and propeller patterns	New format. Equivalent
MEM04018B	Perform general woodworking machine operations	MEM04018	Perform general woodworking machine operations	New format. Equivalent
MEM04019B	Perform refractory installation and repair	MEM04019	Perform refractory installation and repair	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM04020A	Supervise individual ferrous melting and casting operation	MEM04020	Supervise individual ferrous melting and casting operation	New format. Equivalent
MEM04021A	Supervise individual non ferrous melting and casting operation	MEM04021	Supervise individual non-ferrous melting and casting operation	New format. Equivalent
MEM04022A	Examine appropriateness of methoding for mould design	MEM04022	Examine appropriateness of methoding for mould design	New format. Equivalent
MEM04023A	Undertake prescribed tests on foundry related materials	MEM04023	Undertake prescribed tests on foundry-related materials	New format. Equivalent
		MEM04024	Produce moulds and cores by hand	New unit. Supersedes MEM04005C - not equivalent
		MEM04025	Produce moulds and cores by hand (advanced)	New unit. Supersedes MEM04005C - not equivalent.
MEM05001B	Perform manual soldering/desoldering - electrical/electronic components	MEM05001	Perform manual soldering/desoldering - electrical/electronic components	New format. Equivalent
MEM05002B	Perform high reliability soldering and desoldering	MEM05002	Perform high reliability soldering and desoldering	New format. Equivalent
MEM05003B	Perform soft soldering	MEM05003	Perform soft soldering	New format. Equivalent
MEM05004C	Perform routine oxy acetylene welding	MEM05004	Perform routine oxy fuel gas welding	New title and format. Equivalent
MEM05005B	Carry out mechanical cutting	MEM05005	Carry out mechanical cutting	New format. Equivalent
MEM05006C	Perform brazing and or silver soldering	MEM05006	Perform brazing and/or silver soldering	New format. Equivalent
MEM05007C	Perform manual heating and thermal cutting	MEM05007	Perform manual heating and thermal cutting	New format. Equivalent
MEM05008C	Perform advanced manual thermal cutting, gouging and shaping	MEM05008	Perform advanced manual thermal cutting, gouging and shaping	New format. Equivalent
MEM05009C	Perform automated thermal cutting	MEM05009	Perform automated thermal cutting	New format. Equivalent
MEM05010C	Apply fabrication, forming and shaping techniques	MEM05010	Apply fabrication, forming and shaping techniques	New format. Equivalent
MEM05011D	Assemble fabricated components	MEM05011	Assemble fabricated components	New format. Equivalent
MEM05012C	Perform routine manual metal arc welding	MEM05012	Perform routine manual metal arc welding	New format. Equivalent
MEM05013C	Perform manual production welding	MEM05013	Perform manual production welding	New format. Equivalent
MEM05014C	Monitor quality of production welding/fabrications	MEM05014	Monitor quality of production welding/fabrications	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM05015D	Weld using manual metal arc welding process	MEM05015	Weld using manual metal arc welding process	New format. Equivalent
MEM05016C	Perform advanced welding using manual metal arc welding process	MEM05016	Perform advanced welding using manual metal arc welding process	New format. Equivalent
MEM05017D	Weld using gas metal arc welding process	MEM05017	Weld using gas metal arc welding process	New format. Equivalent
MEM05018C	Perform advanced welding using gas metal arc welding process	MEM05018	Perform advanced welding using gas metal arc welding process	New format. Equivalent
MEM05019D	Weld using gas tungsten arc welding process	MEM05019	Weld using gas tungsten arc welding process	New format. Equivalent
MEM05020C	Perform advanced welding using gas tungsten arc welding process	MEM05020	Perform advanced welding using gas tungsten arc welding process	New format. Equivalent
MEM05022C	Perform advanced welding using oxy acetylene welding process	MEM05022	Perform advanced welding using oxy acetylene welding process	New format. Equivalent
MEM05023C	Weld using submerged arc welding process	MEM05023	Weld using submerged arc welding process	New format. Equivalent
MEM05024B	Perform welding supervision	MEM05024	Perform welding supervision	New format. Equivalent
MEM05025C	Perform welding/fabrication inspection	MEM05025	Perform welding/fabrication inspection	New format. Equivalent
MEM05026C	Apply welding principles	MEM05026	Apply welding principles	New format. Equivalent
MEM05027A	Perform aluminothermic welding	MEM05027	Perform aluminothermic welding	New format. Equivalent
MEM05036C	Repair/replace/modify fabrications	MEM05036	Repair, replace and/or modify fabrications	New format. Equivalent
MEM05037C	Perform geometric development	MEM05037	Perform geometric development	New format. Equivalent
MEM05038B	Perform advanced geometric development - cylindrical/rectangular	MEM05038	Perform advanced geometric development - cylindrical/rectangular	New format. Equivalent
MEM05039B	Perform advanced geometric development - conical	MEM05039	Perform advanced geometric development - conical	New format. Equivalent
MEM05040B	Perform advanced geometric development - transitions	MEM05040	Perform advanced geometric development - transitions	New format. Equivalent
MEM05041B	Weld using powder flame spraying	MEM05041	Weld using flame powder spraying	New format. Equivalent
MEM05042B	Perform welds to code standards using flux core arc welding process	MEM05042	Perform welds to code standards using flux core arc welding process	New format. Equivalent
MEM05043B	Perform welds to code standards using gas metal arc welding process	MEM05043	Perform welds to code standards using gas metal arc welding process	New format. Equivalent
MEM05044B	Perform welds to code standards using gas tungsten arc welding process	MEM05044	Perform welds to code standards using gas tungsten arc welding process	New format. Equivalent
MEM05045B	Perform pipe welds to code standards using manual metal arc welding process	MEM05045	Perform pipe welds to code standards using manual metal arc welding process	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM05046B	Perform welds to code standards using manual metal arc welding process	MEM05046	Perform welds to code standards using manual metal arc welding process	New format. Equivalent
MEM05047B	Weld using flux core arc welding process	MEM05047	Weld using flux core arc welding process	New format. Equivalent
MEM05048B	Perform advanced welding using flux core arc welding process	MEM05048	Perform advanced welding using flux core arc welding process	New format. Equivalent
MEM05049B	Perform routine gas tungsten arc welding	MEM05049	Perform routine gas tungsten arc welding	New format. Equivalent
MEM05050B	Perform routine gas metal arc welding	MEM05050	Perform routine gas metal arc welding	New format. Equivalent
MEM05051A	Select welding processes	MEM05051	Select welding processes	New format. Equivalent
MEM05052A	Apply safe welding practices	MEM05052	Apply safe welding practices	New format. Equivalent
MEM05053A	Set and edit computer controlled thermal cutting machines	MEM05053	Set and edit computer controlled thermal cutting machines	New format. Equivalent
MEM05054A	Write basic NC/CNC programs for thermal cutting machines	MEM05054	Write basic NC/CNC programs for thermal cutting machines	New format. Equivalent
		MEM05055	Weld using oxy fuel gas welding process	New Fabrication Unit
		MEM05056	Perform routine flux core arc welding	New Fabrication Unit
		MEM05057	Perform routine submerged arc welding	New Fabrication Unit
		MEM05058	Perform welds to code standards using oxy fuel gas welding process	New Fabrication Unit
MEM06001B	Perform hand forging	MEM06001	Perform hand forging	New format. Equivalent
MEM06002B	Perform hammer forging	MEM06002	Perform hammer forging	New format. Equivalent
MEM06003C	Carry out heat treatment	MEM06003	Carry out heat treatment	New format. Equivalent
MEM06004B	Select heat treatment processes and test finished product	MEM06004	Select heat treatment processes and test finished product	New format. Equivalent
MEM06005B	Perform drop and upset forging	MEM06005	Perform drop and upset forging	New format. Equivalent
MEM06006C	Repair springs	MEM06006	Repair springs	New format. Equivalent
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	MEM06007	Perform basic incidental heat/quenching, tempering and annealing	New format. Equivalent
MEM06008A	Hammer forge complex shapes	MEM06008	Hammer forge complex shapes	New format. Equivalent
MEM06009A	Hand forge complex shapes	MEM06009	Hand forge complex shapes	New format. Equivalent
MEM07001B	Perform operational maintenance of machines/equipment	MEM07001	Perform operational maintenance of machines/equipment	New format. Equivalent
MEM07002B	Perform precision shaping/planning/slotting operations	MEM07002	Perform precision shaping/planning/slotting operations	New format. Equivalent
MEM07003B	Perform machine setting (routine)	MEM07003	Perform routine machine setting	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM07004B	Perform machine setting (complex)	MEM07004	Perform complex machine setting	New format. Equivalent
MEM07005C	Perform general machining	MEM07005	Perform general machining	New format. Equivalent
MEM07006C	Perform lathe operations	MEM07006	Perform lathe operations	New format. Equivalent
MEM07007C	Perform milling operations	MEM07007	Perform milling operations	New format. Equivalent
MEM07008D	Perform grinding operations	MEM07008	Perform grinding operations	New format. Equivalent
MEM07009B	Perform precision jig boring operations	MEM07009	Perform precision jig boring operations	New format. Equivalent
MEM07010B	Perform tool and cutter grinding operations	MEM07010	Perform tool and cutter grinding operations	New format. Equivalent
MEM07011B	Perform complex milling operations	MEM07011	Perform complex milling operations	New format. Equivalent
MEM07012B	Perform complex grinding operations	MEM07012	Perform complex grinding operations	New format. Equivalent
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines	MEM07013	Perform machining operations using horizontal and vertical boring machines	New format. Equivalent
MEM07014B	Perform electro-discharge (EDM) machining operations	MEM07014	Perform electro-discharge machining (EDM) operations	New format. Equivalent
MEM07015B	Set computer controlled machines/processes	MEM07015	Set computer controlled machines and processes	New format. Equivalent
MEM07016C	Set and edit computer controlled machines/processes	MEM07016	Set and edit computer controlled machines and processes	New format. Equivalent
MEM07018C	Write basic NC/CNC programs	MEM07018	Write basic NC and CNC programs	New format. Equivalent
MEM07019C	Program NC/CNC machining centre	MEM07019	Program NC and CNC machining centre	New format. Equivalent
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre	MEM07020	Program multiple spindle and multiple axis NC and CNC machining centre	New format. Equivalent
MEM07021B	Perform complex lathe operations	MEM07021	Perform complex lathe operations	New format. Equivalent
MEM07022C	Program CNC wire cut machines	MEM07022	Program CNC wire cut machines	New format. Equivalent
MEM07023C	Program and set up CNC manufacturing cell	MEM07023	Program and set up CNC manufacturing cell	New format. Equivalent
MEM07024B	Operate and monitor machine/process	MEM07024	Operate and monitor machine and process	New format. Equivalent
MEM07025B	Perform advanced machine/process operation	MEM07025	Perform advanced machine and process operation	New format. Equivalent
MEM07026B	Perform advanced plastic processing	MEM07026	Perform advanced plastic processing	New format. Equivalent
MEM07027B	Perform advanced press operations	MEM07027	Perform advanced press operations	New format. Equivalent
MEM07028B	Operate computer controlled machines/processes	MEM07028	Operate computer controlled machines and processes	New format. Equivalent
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	MEM07029	Perform routine sharpening and maintenance of production tools and cutters	New format. Equivalent
MEM07030C	Perform metal spinning lathe operations (basic)	MEM07030	Perform basic metal spinning lathe operations	New format. Equivalent
MEM07031C	Perform metal spinning lathe operations (complex)	MEM07031	Perform complex metal spinning lathe operations	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM07032B	Use workshop machines for basic operations	MEM07032	Use workshop machines for basic operations	New format. Equivalent
MEM07033B	Operate and monitor basic boiler	MEM07033	Operate and monitor basic boiler	New format. Equivalent
MEM07039A	Write programs for industrial robots	MEM07039	Write programs for industrial robots	New format. Equivalent
MEM07040A	Set multistage integrated processes	MEM07040	Set multistage integrated processes	New format. Equivalent
MEM07041A	Perform production machining	MEM07041	Perform production machining	New format. Equivalent
MEM07042A	Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems	MEM07042	Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems	New format. Equivalent
MEM07043A	Identify causes of faulty aluminium extrusions	MEM07043	Identify causes of faulty aluminium extrusions	New format. Equivalent
MEM07044A	Test a new aluminium extrusion die	MEM07044	Test a new aluminium extrusion die	New format. Equivalent
MEM08001B	Perform wire, jig and barrel load/unload work	MEM08001	Perform wire, jig and barrel load/unload work	New format. Equivalent
MEM08002C	Pre-treat work for subsequent surface coating	MEM08002	Pre-treat work for subsequent surface coating	New format. Equivalent
MEM08003C	Perform electroplating operations	MEM08003	Perform electroplating operations	New format. Equivalent
MEM08004B	Finish work using wet, dry and vapour deposition methods	MEM08004	Finish work using wet, dry and vapour deposition methods	New format. Equivalent
MEM08005B	Prepare and produce specialised coatings	MEM08005	Prepare and produce specialised coatings	New format. Equivalent
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	MEM08006	Produce clear and/or coloured and/or sealed anodised films on aluminium	New format. Equivalent
MEM08007B	Control surface finish production and finished product quality	MEM08007	Control surface finish production and finished product quality	New format. Equivalent
MEM08008B	Operate and control surface finishing waste treatment process	MEM08008	Operate and control surface finishing waste treatment process	New format. Equivalent
MEM08009C	Make up solutions	MEM08009	Make up solutions	New format. Equivalent
MEM08010B	Manually finish/polish materials	MEM08010	Manually finish/polish materials	New format. Equivalent
MEM08011B	Prepare surfaces using solvents and/or mechanical means	MEM08011	Prepare surfaces using solvents and/or mechanical means	New format. Equivalent
MEM08012B	Prepare surfaces by abrasive blasting (basic)	MEM08012	Prepare surfaces by abrasive blasting (basic)	New format. Equivalent
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	MEM08013	Prepare surfaces by abrasive blasting (advanced)	New format. Equivalent
MEM08014B	Apply protective coatings (basic)	MEM08014	Apply protective coatings (basic)	New format. Equivalent
MEM08015B	Apply protective coatings (advanced)	MEM08015	Apply protective coatings (advanced)	New format. Equivalent
MEM08016B	Control blast coating by-products, materials and emissions	MEM08016	Control blast coating by-products, materials and emissions	New format. Equivalent
MEM08018B	Electroplate engineering coatings	MEM08018	Electroplate engineering coatings	New format. Equivalent
MEM08019B	Electroplate protective finishes	MEM08019	Electroplate protective finishes	New format. Equivalent



MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM08020B	Electroplate decorative finishes	MEM08020	Electroplate decorative finishes	New format. Equivalent
MEM09002B	Interpret technical drawing	MEM09002	Interpret technical drawing	New format. Equivalent
MEM09003B	Prepare basic engineering drawing	MEM09003	Prepare basic engineering drawing	New format. Equivalent
MEM09004B	Perform electrical/electronic detail drafting	MEM09004	Perform electrical or electronic detail drafting	New format. Equivalent
MEM09005B	Perform basic engineering detail drafting	MEM09005	Perform basic engineering detail drafting	New format. Equivalent
MEM09006B	Perform advanced engineering detail drafting	MEM09006	Perform advanced engineering detail drafting	New format. Equivalent
MEM09007B	Perform advanced mechanical detail drafting	MEM09007	Perform advanced mechanical detail drafting	New format. Equivalent
MEM09008B	Perform advanced structural detail drafting	MEM09008	Perform advanced structural detail drafting	New format. Equivalent
MEM09009C	Create 2D drawings using computer aided design system	MEM09009	Create 2-D drawings using computer-aided design system	New format. Equivalent
MEM09010C	Create 3D models using computer aided design system	MEM09010	Create 3-D models using computer-aided design system	New format. Equivalent
MEM09011B	Apply basic engineering design concepts	MEM09011	Apply basic engineering design concepts	New format. Equivalent
MEM09021B	Interpret and produce curved 3-dimensional shapes	MEM09021	Interpret and produce drawings of curved 3-D shapes	New format. Equivalent
MEM09022A	Create 2D code files using computer aided manufacturing system	MEM09022	Create 2-D code files using computer-aided manufacturing system	New format. Equivalent
MEM09023A	Create 3D code files using computer aided manufacturing system	MEM09023	Create 3-D code files using computer-aided manufacturing system	New format. Equivalent
MEM10001C	Erect structures	MEM10001	Erect structures	New format. Equivalent
MEM10002B	Terminate and connect electrical wiring	MEM10002	Terminate and connect electrical wiring	New format. Equivalent
MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	MEM10003	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	New format. Equivalent
MEM10004B	Enter and change programmable controller operational parameters	MEM10004	Enter and change programmable controller operational parameters	New format. Equivalent
MEM10005B	Commission programmable controller programs	MEM10005	Commission programmable controller programs	New format. Equivalent
MEM10006B	Install machine/plant	MEM10006	Install machine/plant	New format. Equivalent
MEM10007C	Modify control systems	MEM10007	Modify control systems	New format. Equivalent
MEM10008B	Undertake commissioning procedures for plant and/or equipment	MEM10008	Undertake commissioning procedures for plant and/or equipment	New format. Equivalent
MEM10009B	Install refrigeration and air conditioning plant and equipment	MEM10009	Install refrigeration and air conditioning plant and equipment	New format. Equivalent
MEM10010B	Install pipework and pipework assemblies	MEM10010	Install pipework and pipework assemblies	New format. Equivalent
MEM10011B	Terminate and connect specialist cables	MEM10011	Terminate and connect specialist cables	New format. Equivalent



MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM10013A	Install split air conditioning systems and associated pipework	MEM10013	Install split air conditioning systems and associated pipework	New format. Equivalent
MEM11001C	Erect/dismantle scaffolding and equipment	MEM11001	Erect/dismantle scaffolding and equipment	New format. Equivalent
MEM11002C	Erect/dismantle complex scaffolding and equipment	MEM11002	Erect/dismantle intermediate scaffolding and equipment	New title and format. Equivalent
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	MEM11003	Coordinate erection/dismantling of complex scaffolding/equipment	New format. Equivalent
MEM11004B	Undertake dogging	MEM11004	Undertake dogging	New format. Equivalent
MEM11005B	Pick and process order	MEM11005	Pick and process order	New format. Equivalent
MEM11006B	Perform production packaging	MEM11006	Perform production packaging	New format. Equivalent
MEM11007B	Administer inventory procedures	MEM11007	Administer inventory procedures	New format. Equivalent
MEM11008B	Package materials (stores and warehouse)	MEM11008	Package materials (stores and warehouse)	New format. Equivalent
MEM11009B	Handle/move bulk fluids/gases	MEM11009	Handle/move bulk fluids/gases	New format. Equivalent
MEM11010B	Operate mobile load shifting equipment	MEM11010	Operate mobile load shifting equipment	New format. Equivalent
MEM11011B	Undertake manual handling	MEM11011	Undertake manual handling	New format. Equivalent
MEM11012B	Purchase materials	MEM11012	Purchase materials	New format. Equivalent
MEM11013B	Undertake warehouse receival process	MEM11013	Undertake warehouse receival process	New format. Equivalent
MEM11014B	Undertake warehouse dispatch process	MEM11014	Undertake warehouse dispatch process	New format. Equivalent
MEM11015B	Manage warehouse inventory system	MEM11015	Manage warehouse inventory system	New format. Equivalent
MEM11016B	Order materials	MEM11016	Order materials	New format. Equivalent
MEM11017B	Organise and lead stocktakes	MEM11017	Organise and lead stocktakes	New format. Equivalent
MEM11018B	Organise and maintain warehouse stock receival and/or dispatch system	MEM11018	Organise and maintain warehouse stock receival and dispatch system	New format. Equivalent
MEM11019B	Undertake tool store procedures	MEM11019	Undertake tool store procedures	New format. Equivalent
MEM11020B	Perform advanced warehouse computer operations	MEM11020	Perform advanced warehouse computer operations	New format. Equivalent
MEM11021B	Perform advanced operation of load shifting equipment	MEM11021	Perform advanced operation of load shifting equipment	New format. Equivalent
MEM11022B	Operate fixed/moveable load shifting equipment	MEM11022	Operate fixed/moveable load shifting equipment	New format. Equivalent
MEM11023A	Operate a bridge and gantry crane	MEM11023	Operate a bridge and gantry crane	New format. Equivalent
MEM11024A	Undertake basic rigging	MEM11024	Undertake basic rigging	New format. Equivalent
MEM11025A	Operate a non-slewing mobile crane of greater than three tonnes capacity	MEM11025	Operate a non-slewing mobile crane of greater than three tonnes capacity	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM12001B	Use comparison and basic measuring devices	MEM12001	Use comparison and basic measuring devices	New format. Equivalent
MEM12002B	Perform electrical/electronic measurement	MEM12002	Perform electrical/electronic measurement	New format. Equivalent
MEM12003B	Perform precision mechanical measurement	MEM12003	Perform precision mechanical measurement	New format. Equivalent
MEM12004B	Perform precision electrical/electronic measurement	MEM12004	Perform precision electrical/electronic measurement	New format. Equivalent
MEM12005B	Calibrate measuring equipment	MEM12005	Calibrate measuring equipment	New format. Equivalent
MEM12006C	Mark off/out (general engineering)	MEM12006	Mark off/out (general engineering)	New format. Equivalent
MEM12007D	Mark off/out structural fabrications and shapes	MEM12007	Mark off/out structural fabrications and shapes	New format. Equivalent
MEM12019B	Measure components using coordinate measuring machines	MEM12019	Measure components using coordinate measuring machines	New format. Equivalent
MEM12020B	Set and operate coordinate measuring machines	MEM12020	Set and operate coordinate measuring machines	New format. Equivalent
MEM12021B	Program coordinate measuring machines	MEM12021	Program coordinate measuring machines	New format. Equivalent
MEM12022B	Program coordinate measuring machines (advanced)	MEM12022	Program coordinate measuring machines (advanced)	New format. Equivalent
MEM12023A	Perform engineering measurements	MEM12023	Perform engineering measurements	New format. Equivalent
MEM12024A	Perform computations	MEM12024	Perform computations	New format. Equivalent
MEM12025A	Use graphical techniques and perform simple statistical computations	MEM12025	Use graphical techniques and perform simple statistical computations	New format. Equivalent
		MEM12026	Perform advanced trade calculations in a manufacturing, engineering or related environment	New Computations Unit
MEM13001B	Perform emergency first aid	MEM13001	Perform emergency first aid	New format. Equivalent
MEM13002B	Undertake occupational health and safety activities in the workplace	MEM13002	Undertake work health and safety activities in the workplace	New format. Equivalent
MEM13003B	Work safely with industrial chemicals and materials	MEM13003	Work safely with industrial chemicals and materials	New format. Equivalent
MEM13004B	Work safely with molten metals/glass	MEM13004	Work safely with molten metals/glass	New format. Equivalent
MEM13006B	Collect and evaluate occupational health and safety data for an enterprise or section of an enterprise	MEM13006	Collect and evaluate work health and safety data for an enterprise or section of an enterprise	New format. Equivalent
MEM13007B	Maintain water treatment systems for cooling towers	MEM13007	Maintain water treatment systems for cooling towers	New format. Equivalent
MEM13010A	Supervise occupational health and safety in an industrial work environment	MEM13010	Supervise work health and safety in an industrial work environment	New format. Equivalent
MEM13013B	Work safely with ionizing radiation	MEM13013	Work safely with ionizing radiation	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM13014A	Apply principles of occupational health and safety in the work environment			Superseded by MEM13015 Not equivalent
		MEM13015	Work safely and effectively in manufacturing and engineering	New unit, supersedes MEM13014A, MEM14004A, MEM15002A MEM15024A MEM16007A Not equivalent
MEM14001B	Schedule material deliveries	MEM14001	Schedule material deliveries	New format. Equivalent
MEM14002B	Undertake basic process planning	MEM14002	Undertake basic process planning	New format. Equivalent
MEM14003B	Undertake basic production scheduling	MEM14003	Undertake production scheduling	New Title and format. Equivalent
MEM14004A	Plan to undertake a routine task			Superseded by MEM13015 Not equivalent
MEM14005A	Plan a complete activity	MEM14006	Plan work activities	Equivalent
MEM15001B	Perform basic statistical quality control	MEM15001	Perform basic statistical quality control	New format. Equivalent
MEM15002A	Apply quality systems			Superseded by MEM13015 Not equivalent
MEM15003B	Use improvement processes in team activities	MEM15003	Use improvement processes in team activities	New format. Equivalent
MEM15004B	Perform inspection	MEM15004	Perform inspection	New format. Equivalent
MEM15005B	Select and control inspection processes and procedures	MEM15005	Select and control inspection processes and procedures	New format. Equivalent
MEM15007B	Conduct product and/or process capability studies	MEM15007	Conduct product and/or process capability studies	New format. Equivalent
MEM15008B	Perform advanced statistical quality control	MEM15008	Perform advanced statistical quality control	New format. Equivalent
MEM15010B	Perform laboratory procedures	MEM15010	Perform laboratory procedures	New format. Equivalent
MEM15011B	Exercise external quality assurance	MEM15011	Exercise external quality assurance	New format. Equivalent
MEM15012B	Maintain/supervise the application of quality procedures	MEM15012	Maintain/supervise the application of quality procedures	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM15024A	Apply quality procedures			Superseded by MEM13015 Not equivalent
MEM16001B	Give formal presentations and take part in meetings	MEM16001	Give formal presentations and take part in meetings	New format. Equivalent
MEM16002C	Conduct formal interviews and negotiations	MEM16002	Conduct formal interviews and negotiations	New format. Equivalent
MEM16003B	Provide advanced customer service	MEM16003	Provide advanced customer service	New format. Equivalent
MEM16004B	Perform internal/external customer service	MEM16004	Perform internal/external customer service	New format. Equivalent
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	MEM16005	Operate as a team member to conduct manufacturing, engineering or related activities	New format. Equivalent
MEM16006A	Organise and communicate information	MEM16006	Organise and communicate information	New format. Equivalent
MEM16007A	Work with others in a manufacturing, engineering or related environment			Superseded by MEM13015 Not equivalent
MEM16008A	Interact with computing technology	MEM16008	Interact with computing technology	New format. Equivalent
MEM16009A	Research and analyse engineering information	MEM16009	Research and analyse engineering information	New format. Equivalent
MEM16010A	Write reports	MEM16010	Write reports	New format. Equivalent
MEM16011A	Communicate with individuals and small groups	MEM16011	Communicate with individuals and small groups	New format. Equivalent
MEM16012A	Interpret technical specifications and manuals	MEM16012	Interpret technical specifications and manuals	New format. Equivalent
MEM16013A	Operate in a self-directed team	MEM16013	Operate in a self-directed team	New format. Equivalent
MEM16014A	Report technical information	MEM16014	Report technical information	New format. Equivalent
MEM17001B	Assist in development and deliver training in the workplace	MEM17001	Assist in development and deliver training in the workplace	New format. Equivalent
MEM17002B	Conduct workplace assessment	MEM17002	Conduct workplace assessment	New format. Equivalent
MEM17003A	Assist in the provision of on the job training	MEM17003	Assist in the provision of on-the-job training	New format. Equivalent
MEM18001C	Use hand tools	MEM18001	Use hand tools	New format. Equivalent
MEM18002B	Use power tools/hand held operations	MEM18002	Use power tools/hand held operations	New format. Equivalent
MEM18003C	Use tools for precision work	MEM18003	Use tools for precision work	New format. Equivalent
MEM18004B	Maintain and overhaul mechanical equipment	MEM18004	Maintain and overhaul mechanical equipment	New format. Equivalent
MEM18005B	Perform fault diagnosis, installation and removal of bearings	MEM18005	Perform fault diagnosis, installation and removal of bearings	New format. Equivalent
MEM18006C	Repair and fit engineering components	MEM18006	Perform precision fitting of engineering components	New Title and format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	MEM18007	Maintain and repair mechanical drives and mechanical transmission assemblies	New format. Equivalent
MEM18008B	Balance equipment	MEM18008	Balance equipment	New format. Equivalent
MEM18009B	Perform levelling and alignment of machines and engineering components	MEM18009	Perform precision levelling and alignment of machines and engineering components	New Title and format. Equivalent
MEM18010C	Perform equipment condition monitoring and recording	MEM18010	Perform equipment condition monitoring and recording	New format. Equivalent
MEM18011C	Shut down and isolate machines/equipment	MEM18011	Shut down and isolate machines/equipment	New format. Equivalent
MEM18012B	Perform installation and removal of mechanical seals	MEM18012	Perform installation and removal of mechanical seals	New format. Equivalent
MEM18013B	Perform gland packing	MEM18013	Perform gland packing	New format. Equivalent
MEM18014B	Manufacture press tools and gauges	MEM18014	Manufacture press tools and gauges	New format. Equivalent
MEM18015B	Maintain tools and dies	MEM18015	Maintain tools and dies	New format. Equivalent
MEM18016B	Analyse plant and equipment condition monitoring results	MEM18016	Analyse plant and equipment condition monitoring results	New format. Equivalent
MEM18017C	Modify mechanical systems and equipment	MEM18017	Modify mechanical systems and equipment	New format. Equivalent
MEM18018C	Maintain pneumatic system components	MEM18018	Maintain pneumatic system components	New format. Equivalent
MEM18019B	Maintain pneumatic systems	MEM18019	Maintain pneumatic systems	New format. Equivalent
MEM18020B	Maintain hydraulic system components	MEM18020	Maintain hydraulic system components	New format. Equivalent
MEM18021B	Maintain hydraulic systems	MEM18021	Maintain hydraulic systems	New format. Equivalent
MEM18022B	Maintain fluid power controls	MEM18022	Maintain fluid power controls	New format. Equivalent
MEM18023B	Modify fluid power system operation	MEM18023	Modify fluid power system operation	New format. Equivalent
MEM18024B	Maintain engine cooling systems	MEM27001	Maintain and repair stationary and mobile plant engine cooling systems	Equivalent
MEM18025B	Service combustion engines	MEM27032	Service combustion engines	Equivalent
MEM18026C	Test compression ignition fuel systems	MEM27002	Test and repair compression ignition systems	Equivalent
MEM18027C	Overhaul engine fuel system components	MEM27003	Overhaul engine fuel system components	Equivalent
MEM18028B	Maintain engine lubrication systems	MEM27004	Maintain and repair engine lubrication systems	Equivalent
MEM18029B	Tune diesel engines	MEM27005	Tune diesel engines	Equivalent
MEM18030B	Diagnose and rectify low voltage electrical systems	MEM27006	Diagnose and rectify batteries, low voltage sensors and circuits	Equivalent
MEM18031B	Diagnose and rectify low voltage starting systems	MEM27007	Diagnose and rectify low voltage starting systems	Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM18032B	Maintain induction/exhaust systems	MEM27008	Maintain induction, exhaust and emission control systems	Not equivalent
MEM18033B	Perform engine bottom-end overhaul	MEM27030	Perform engine bottom-end overhaul	Equivalent
MEM18034B	Perform engine top-end overhaul	MEM27031	Perform engine top-end overhaul	Equivalent
MEM18035B	Diagnose and rectify braking systems	MEM27009	Diagnose and rectify braking systems	Equivalent
MEM18037B	Diagnose and rectify low voltage charging systems	MEM27010	Diagnose and rectify low voltage charging systems	Equivalent
MEM18038B	Maintain wheels and tyres	MEM27029	Maintain wheels and tyres	Equivalent
MEM18039B	Diagnose and rectify track type undercarriage	MEM27011	Maintain track type undercarriage on mobile plant	Equivalent
MEM18040B	Maintain suspension systems	MEM27012	Maintain mobile plant suspension systems	Equivalent
MEM18041B	Maintain steering systems	MEM27013	Maintain steering systems	Equivalent
MEM18042C	Diagnose and rectify manual transmissions	MEM27028	Diagnose and rectify manual transmissions	Equivalent
MEM18043C	Diagnose and rectify automatic transmissions	MEM27014	Diagnose and rectify automatic transmissions	Equivalent
MEM18044C	Diagnose and rectify drive line and final drives	MEM27015	Diagnose and rectify drive line and final drives	Equivalent
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	MEM18045	Fault find and repair electrical equipment/components up to 250 volts single phase supply	New format. Equivalent
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	MEM18046	Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	New format. Equivalent
MEM18047B	Diagnose and maintain electronic controlling systems on mobile plant	MEM27016	Diagnose and maintain electronic controlling systems on mobile and stationary plant	Equivalent
MEM18048B	Fault find and repair/rectify basic electrical circuits	MEM18048	Fault find and repair/rectify basic electrical circuits	New format. Equivalent
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	MEM18049	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	New format. Equivalent
MEM18050C	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	MEM18050	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	New format. Equivalent
MEM18051B	Fault find and repair/rectify complex electrical circuits	MEM18051	Fault find and repair/rectify complex electrical circuits	New format. Equivalent
MEM18052B	Maintain fluid power systems for mobile plant	MEM27017	Maintain, fault find and rectify hydraulic systems for mobile plant	Equivalent
MEM18053B	Modify fluid power control systems	MEM18053	Modify fluid power control systems	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM18054B	Fault find, test and calibrate instrumentation systems and equipment	MEM18054	Fault find, test and calibrate instrumentation systems and equipment	New format. Equivalent
MEM18055B	Dismantle, replace and assemble engineering components	MEM18055	Dismantle, replace and assemble engineering components	New format. Equivalent
MEM18056B	Diagnose and repair analog equipment and components	MEM18056	Diagnose and repair analog equipment and components	New format. Equivalent
MEM18057B	Maintain/service analog/digital electronic equipment	MEM18057	Maintain/service analog/digital electronic equipment	New format. Equivalent
MEM18058C	Modify electronic equipment	MEM18058	Modify electronic equipment	New format. Equivalent
MEM18059B	Modify electronic systems	MEM18059	Modify electronic systems	New format. Equivalent
MEM18060B	Maintain, repair control instrumentation - single and multiple loop control systems	MEM18060	Maintain, repair control instrumentation - single and multiple loop control systems	New format. Equivalent
MEM18061B	Maintain/calibrate complex control systems	MEM18061	Maintain/calibrate complex control systems	New format. Equivalent
MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	MEM18062	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	New format. Equivalent
MEM18063B	Terminate signal and data cables	MEM18063	Terminate signal and data cables	New format. Equivalent
MEM18064B	Maintain instrumentation system components	MEM18064	Maintain instrumentation system components	New format. Equivalent
MEM18065B	Diagnose and repair digital equipment and components	MEM18065	Diagnose and repair digital equipment and components	New format. Equivalent
MEM18066B	Diagnose and repair microprocessor-based equipment	MEM18066	Diagnose and repair microprocessor-based equipment	New format. Equivalent
MEM18067B	Tune control loops - multi controller or multi element systems	MEM18067	Tune control loops - multi controller or multi element systems	New format. Equivalent
MEM18069B	Maintain, repair instrumentation process control analysers	MEM18069	Maintain, repair instrumentation process control analysers	New format. Equivalent
MEM18071B	Connect/disconnect fluid conveying system components	MEM18071	Connect and disconnect fluid conveying system components	New format. Equivalent
MEM18072B	Manufacture fluid conveying conductor assemblies	MEM18072	Manufacture fluid conveying conductor assemblies	New format. Equivalent
MEM18073A	Perform advanced equipment testing and diagnostics on mobile plant and equipment	MEM27033	Perform advanced equipment testing and diagnostics on mobile plant and equipment	New format. Equivalent
		MEM18083	Handle fluorocarbon refrigerants according to regulations	New unit



MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM18084A	Commission and decommission split air conditioning systems	MEM18084	Commission and decommission split air conditioning systems	New format. Equivalent
MEM18085A	Install, service and repair domestic air conditioning and refrigeration appliances	MEM18085	Install, service and repair domestic air conditioning and refrigeration appliances	New format. Equivalent
MEM18086B	Test, recover, evacuate and charge refrigeration systems	MEM18086	Test, recover, evacuate and charge refrigeration systems	New format. Equivalent
MEM18087B	Service and repair domestic and light commercial refrigeration and air conditioning equipment	MEM18087	Service and repair domestic and light commercial refrigeration and air conditioning equipment	New format. Equivalent
MEM18088B	Maintain and repair commercial air conditioning systems and components	MEM18088	Maintain and repair commercial air conditioning systems and components	New format. Equivalent
MEM18089B	Maintain and repair central air handling systems	MEM18089	Maintain and repair central air handling systems	New format. Equivalent
MEM18090B	Maintain and repair industrial refrigeration systems and components	MEM18090	Maintain and repair industrial refrigeration systems and components	New format. Equivalent
MEM18091B	Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems	MEM18091	Maintain and repair multistage, cascade and/or ultra-cold industrial refrigeration systems	New format. Equivalent
MEM18092B	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	MEM18092	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	New format. Equivalent
MEM18093B	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	MEM18093	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	New format. Equivalent
MEM18094B	Service and repair commercial refrigeration	MEM18094	Service and repair commercial refrigeration	New format. Equivalent
MEM18095A	Maintain and repair cooling towers/evaporative condensers and associated equipment	MEM18095	Maintain and repair cooling towers/evaporative condensers and associated equipment	New format. Equivalent
MEM18096A	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	MEM18096	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	New format. Equivalent
MEM18097A	Manufacture cavity dies	MEM18097	Manufacture cavity dies	New format. Equivalent
MEM18098A	Prepare to perform work associated with fuel system installation and servicing	MEM18098	Prepare to perform work associated with fuel system installation and servicing	New format. Equivalent
MEM19001B	Perform jewellery metal casting	MEM19001	Perform jewellery metal casting	New format. Equivalent
MEM19002B	Prepare jewellery illustrations	MEM19002	Prepare jewellery illustrations	New format. Equivalent
MEM19003B	Handle gem materials	MEM19003	Handle gem materials	New format. Equivalent
MEM19004B	Handle and examine gemstone materials	MEM19004	Handle and examine gemstone materials	New format. Equivalent



MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM19005B	Produce three-dimensional precision items	MEM19005	Produce three-dimensional precision items	New format. Equivalent
MEM19006B	Replace watch batteries	MEM19006	Replace watch batteries	New format. Equivalent
MEM19007B	Perform gemstone setting	MEM19007	Perform gemstone setting	New format. Equivalent
MEM19008B	Prepare jewellery designs	MEM19008	Prepare jewellery designs	New format. Equivalent
MEM19009B	Perform investment procedures for lost wax casting process	MEM19009	Perform investment procedures for lost wax casting process	New format. Equivalent
MEM19010B	Produce rubber moulds for lost wax casting process	MEM19010	Produce rubber moulds for lost wax casting process	New format. Equivalent
MEM19011B	Perform wax injection of moulds for lost wax casting process	MEM19011	Perform wax injection of moulds for lost wax casting process	New format. Equivalent
MEM19012B	Produce jewellery wax model	MEM19012	Produce jewellery wax model	New format. Equivalent
MEM19013B	Produce jewellery metal masters	MEM19013	Produce jewellery metal masters	New format. Equivalent
MEM19014B	Perform hand engraving	MEM19014	Perform hand engraving	New format. Equivalent
MEM19015B	Perform jewellery enamelling	MEM19015	Perform jewellery enamelling	New format. Equivalent
MEM19016B	Construct jewellery components	MEM19016	Construct jewellery components	New format. Equivalent
MEM19017B	Fabricate jewellery items	MEM19017	Fabricate jewellery items	New format. Equivalent
MEM19018B	Repair jewellery items	MEM19018	Repair jewellery items	New format. Equivalent
MEM19020B	Fault-find and maintain micro-mechanisms	MEM19020	Fault find and maintain micro-mechanisms	New format. Equivalent
MEM19021B	Diagnose and service micro-mechanisms	MEM19021	Diagnose and service micro-mechanisms	New format. Equivalent
MEM19022B	Perform precision micro-mechanism diagnosis and servicing	MEM19022	Perform precision micro-mechanism diagnosis and servicing	New format. Equivalent
MEM20001A	Produce keys	MEM20001	Produce keys	New format. Equivalent
MEM20002A	Assemble and test lock mechanisms	MEM20002	Assemble and test lock mechanisms	New format. Equivalent
MEM20003A	Install and upgrade locks and hardware	MEM20003	Install and upgrade locks and hardware	New format. Equivalent
MEM20004A	Gain entry	MEM20004	Gain entry	New format. Equivalent
MEM20005A	Install and maintain door control devices/systems	MEM20005	Install and maintain door control devices/systems	New format. Equivalent
MEM20006A	Maintain and service mechanical locking devices	MEM20006	Maintain and service mechanical locking devices	New format. Equivalent
MEM20007A	Plan and prepare a masterkey system	MEM20007	Plan and prepare a masterkey system	New format. Equivalent
MEM20008A	Develop and implement a masterkey system	MEM20008	Develop and implement a masterkey system	New format. Equivalent
MEM20009A	Gain entry and reinstate fire and security containers	MEM20009	Gain entry and reinstate fire and security containers	New format. Equivalent
MEM20010A	Gain entry and reinstate automotive locking systems	MEM20010	Gain entry and reinstate automotive locking systems	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM20011A	Service and repair fire and security containers	MEM20011	Service and repair fire and security containers	New format. Equivalent
MEM20012A	Service and repair mechanical automotive locking systems	MEM20012	Service and repair mechanical automotive locking systems	New format. Equivalent
MEM20013A	Service automotive transponder systems	MEM20013	Service automotive transponder systems	New format. Equivalent
MEM20014A	Perform a site security survey	MEM20014	Perform a site security survey	New format. Equivalent
MEM21001A	Replace watch batteries, capacitors and bands	MEM21001	Replace watch batteries, capacitors and bands	New format. Equivalent
MEM21002A	Perform watch movement exchange	MEM21002	Perform watch movement exchange	New format. Equivalent
MEM21003A	Perform watch case servicing, repair and refurbishment	MEM21003	Perform watch case servicing, repair and refurbishment	New format. Equivalent
MEM21004A	Clean watch and clock components	MEM21004	Clean watch and clock components	New format. Equivalent
MEM21005A	Diagnose faults in quartz watches	MEM21005	Diagnose faults in quartz watches	New format. Equivalent
MEM21006A	Service quartz watches	MEM21006	Service quartz watches	New format. Equivalent
MEM21007A	Service complex quartz watches	MEM21007	Service complex quartz watches	New format. Equivalent
MEM21008A	Service mechanical watches	MEM21008	Service mechanical watches	New format. Equivalent
MEM21009A	Inspect, diagnose, adjust and repair mechanical watches	MEM21009	Inspect, diagnose, adjust and repair mechanical watches	New format. Equivalent
MEM21010A	Service watch power generating systems	MEM21010	Service watch power generating systems	New format. Equivalent
MEM21011A	Service calendar and other dial indication mechanisms for watches	MEM21011	Service calendar and other dial indication mechanisms for watches	New format. Equivalent
MEM21012A	Service and repair mechanical watch oscillating systems	MEM21012	Service and repair mechanical watch oscillating systems	New format. Equivalent
MEM21013A	Service, test and adjust watch escapements	MEM21013	Service, test and adjust watch escapements	New format. Equivalent
MEM21014A	Service mechanical chronograph watches	MEM21014	Service mechanical chronograph watches	New format. Equivalent
MEM21015A	Perform precision watch timing and adjustment	MEM21015	Perform precision watch timing and adjustment	New format. Equivalent
MEM21016A	Install and set up clocks	MEM21016	Install and set up clocks	New format. Equivalent
MEM21017A	Service and repair clock timepieces	MEM21017	Service and repair clock timepieces	New format. Equivalent
MEM21018A	Service clock escapements and oscillating systems	MEM21018	Service clock escapements and oscillating systems	New format. Equivalent
MEM21019A	Service and repair clock striking mechanisms	MEM21019	Service and repair clock striking mechanisms	New format. Equivalent
MEM21020A	Service and repair clock chiming mechanisms	MEM21020	Service and repair clock chiming mechanisms	New format. Equivalent
MEM21021A	Restore clockwork mechanisms	MEM21021	Restore clockwork mechanisms	New format. Equivalent
MEM21022A	Manufacture watch and clock components	MEM21022	Manufacture watch and clock components	New format. Equivalent
MEM21023A	Plan, set up and operate horological workshop or service centre	MEM21023	Plan, set up and operate horological workshop or service centre	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM25001B	Apply fibre-reinforced materials	MEM25001	Apply fibre-reinforced materials	New format. Equivalent
MEM25002B	Form and integrate fibre-reinforced structures	MEM25002	Form and integrate fibre-reinforced structures	New format. Equivalent
MEM25003B	Set up marine vessel structures	MEM25003	Set up marine vessel structures	New format. Equivalent
MEM25004B	Fair and shape surfaces	MEM25004	Fair and shape surfaces	New format. Equivalent
MEM25005B	Construct and assemble marine vessel timber components	MEM25005	Construct and assemble marine vessel timber components	New format. Equivalent
MEM25006B	Undertake marine sheathing operations	MEM25006	Undertake marine sheathing operations	New format. Equivalent
MEM25007B	Maintain marine vessel surfaces	MEM25007	Maintain marine vessel surfaces	New format. Equivalent
MEM25008B	Repair marine vessel surfaces and structures	MEM25008	Repair marine vessel surfaces and structures	New format. Equivalent
MEM25009B	Form timber shapes using hot processes	MEM25009	Form timber shapes using hot processes	New format. Equivalent
MEM25010B	Perform fitout procedures	MEM25010	Perform fitout procedures	New format. Equivalent
MEM25011B	Install marine systems	MEM25011	Install marine systems	New format. Equivalent
MEM25012B	Install and test operations of marine auxiliary systems	MEM25012	Install and test operations of marine auxiliary systems	New format. Equivalent
MEM25013B	Produce three-dimensional plugs/moulds	MEM25013	Produce three-dimensional plugs/moulds	New format. Equivalent
MEM25014B	Perform marine slipping operations	MEM25014	Perform marine slipping operations	New format. Equivalent
MEM25015A	Assemble and install equipment and accessories/ancillaries	MEM25015	Assemble and install equipment and accessories/ancillaries	New format. Equivalent
MEM26001A	Lay up composites using open moulding techniques	MEM26001	Lay up composites using open moulding techniques	New format. Equivalent
MEM26002A	Lay up composites using vacuum closed moulding techniques	MEM26002	Lay up composites using vacuum closed moulding techniques	New format. Equivalent
MEM26003A	Lay up composites using pressure closed moulding techniques	MEM26003	Lay up composites using pressure closed moulding techniques	New format. Equivalent
MEM26004A	Make basic plugs for composites fabrication	MEM26004	Make basic plugs for composites fabrication	New format. Equivalent
MEM26005A	Make basic moulds for composites fabrication	MEM26005	Make basic moulds for composites fabrication	New format. Equivalent
MEM26006A	Mark and cut out sheets for composite use	MEM26006	Mark and cut out sheets for composite use	New format. Equivalent
MEM26007A	Select and use reinforcing appropriate for product	MEM26007	Select and use reinforcing appropriate for product	New format. Equivalent
MEM26008A	Select and use resin systems appropriate for product	MEM26008	Select and use resin systems appropriate for product	New format. Equivalent
MEM26009A	Select and use cores and fillers appropriate for product	MEM26009	Select and use cores and fillers appropriate for product	New format. Equivalent
MEM26010A	Store and handle composite materials	MEM26010	Store and handle composite materials	New format. Equivalent

MEM05 Release 11.1		MEM Release 2.0		
Code	Title	Code	Title	Comment / Equivalence
MEM26011A	Determine materials and techniques for a composite component or product	MEM26011	Determine materials and techniques for a composite component or product	New format. Equivalent
MEM26012A	Record and trial work processes for one-off composite products	MEM26012	Record and trial work processes for one-off composite products	New format. Equivalent
MEM26013A	Select and use composite processes or systems appropriate for product	MEM26013	Select and use composite processes or systems appropriate for product	New format. Equivalent
MEM26014A	Adjust resin chemicals for current conditions	MEM26014	Adjust resin chemicals for current conditions	New format. Equivalent
MEM26015A	Select and apply repair techniques	MEM26015	Select and apply repair techniques	New format. Equivalent
MEM26016A	Select and use joining techniques	MEM26016	Select and use joining techniques	New format. Equivalent
MEM26017A	Prepare composite or other substrate surfaces	MEM26017	Prepare composite or other substrate surfaces	New format. Equivalent
MEM26018A	Organise composite trials	MEM26018	Organise composite trials	New format. Equivalent
MEM26019A	Finish a composite product	MEM26019	Finish a composite product	New format. Equivalent
MEM26020A	Identify and interpret required standards for composites	MEM26020	Identify and interpret required standards for composites	New format. Equivalent
		MEM27018	Test, diagnose and rectify mobile and stationary plant external monitoring and control systems	New unit
		MEM27019	Diagnose, repair and replace diesel engines in stationary and mobile plant	New unit
		MEM27020	Apply knowledge of large combustion engine operations to service and maintenance tasks	New unit
		MEM27021	Maintain, fault find and repair stationary plant gas turbine engines	New unit
		MEM27022	Maintain, fault find and repair traction drive mechanics	New unit
		MEM27023	Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment	New unit
		MEM27024	Diagnose and rectify mobile plant hydrostatic systems	New unit
		MEM27025	Maintain, diagnose and rectify fluid power controls in mobile equipment	New unit
		MEM27026	Service and repair mobile plant air conditioning systems	New unit
		MEM27027	Install or modify mobile plant air conditioning systems	New unit

MEM05 Release 11.1		MEM Release 2.0		Comment / Equivalence
Code	Title	Code	Title	
MEM50001B	Classify recreational boating technologies and features	MEM50001	Classify recreational boating technologies and features	New format. Equivalent
MEM50002B	Work safely on marine craft	MEM50002	Work safely on marine craft	New format. Equivalent
MEM50003B	Follow work procedures to maintain the marine environment	MEM50003	Follow work procedures to maintain the marine environment	New format. Equivalent
MEM50004B	Maintain quality of environment by following marina codes	MEM50004	Maintain quality of environment by following marina codes	New format. Equivalent
MEM50005B	Refuel vessels	MEM50005	Refuel vessels	New format. Equivalent
MEM50006B	Check operational capability of marine craft	MEM50006	Check operational capability of marine craft	New format. Equivalent
MEM50007B	Check operational capability of sails and sail operating equipment	MEM50007	Check operational capability of sails and sail operating equipment	New format. Equivalent
MEM50008B	Carry out trip preparation and planning	MEM50008	Carry out trip preparation and planning	New format. Equivalent
MEM50009B	Safely operate a mechanically powered recreational boat	MEM50009	Safely operate a mechanically powered recreational boat	New format. Equivalent
MEM50010B	Respond to boating emergencies and incidents	MEM50010	Respond to boating emergencies and incidents	New format. Equivalent

### Mapping of Release 1.2 to Release 2.0 MEM Units of Competency

Code	Title	Code	Title	Comment / Equivalence
		MEM10016	Terminate and test electrical wiring and accessories	Updated prerequisites. Equivalent
		MEM10019	Select circuit protection devices by type and rating, fit to switchboards and install earthing	Updated prerequisites. Equivalent
		MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment	Updated prerequisites. Equivalent
		MEM10021	Inspect, test and verify electrical installations	Updated prerequisites. Equivalent
		MEM10023	Design and connect control switching of circuits for building services and industrial equipment	Updated prerequisites. Equivalent
		MEM10024	Install and troubleshoot luminaires and ancillary equipment	Updated prerequisites. Equivalent
		MEM10025	Undertake a capstone assessment	Updated prerequisites. Equivalent

Code	Title	Code	Title	Comment / Equivalence
		MEM13016	Work in hazardous areas	Updated prerequisites. Equivalent
		MEM13017	Apply safety practices, procedures and compliance standards associated with licensed electrical work	Updated prerequisites. Equivalent
		MEM18100	Fault-find, test and rectify AC machines and circuits	Updated prerequisites. Equivalent
		MEM18102	Fault-find, test and rectify single and three-phase transformers	Updated prerequisites. Equivalent
		MEM18103	Fault-find, test and rectify electrical circuits and equipment	Updated prerequisites. Equivalent
		MEM18104	Dismantle, replace and assemble electrical components and equipment	Updated prerequisites. Equivalent
		MEM18105	Disconnect and reconnect high voltage fixed wired equipment	Updated prerequisites. Equivalent
		MEM18106	Terminate communication and data cables	Updated prerequisites. Equivalent
		MEM18108	Troubleshoot analog and digital electronic equipment	Updated prerequisites. Equivalent
		MEM18109	Troubleshoot instrumentation systems and equipment	Updated prerequisites. Equivalent

## Appendix 2: Certificate III in Engineering – Industrial Electrician

### Implementation and training advice for the Industrial Electrician qualification

This qualification covers the skills and knowledge required for employment as an industrial electrician within the metal, engineering, manufacturing and associated industries where Engineering Tradesperson – Industrial Electricians work. This qualification provides competencies in the ability to select, set up and install, test, fault find, repair and maintain electrical systems and equipment in buildings and industrial environments including oil/gas installations, mine sites, processing plants and the like. The qualification covers the Essential Performance Capabilities as required by electrical regulators and includes a capstone assessment.

This qualification is designed to provide an industry recognised skills profile related to trade work as an Engineering Tradesperson – Industrial Electrician. Skills development would usually be undertaken through an apprenticeship arrangement where a mix of on and off-the-job training would be specified in the Training Plan associated with the Contract of Training between the employer and apprentice.

Assessment of some of the units of competency, must, where indicated, include evidence of the candidate's performance in a productive work environment where there is a sufficient range of appropriate tasks and materials to cover the scope of application of the units. All outcomes must reflect the standard of performance inherent in the job.

A Training Package qualification can not specify how the qualification is delivered. It can contain specific requirements for assessment (as mentioned above). As the move towards competency-based progression and completion in apprenticeships is better embraced, the relationship between on and off job training and assessment is even more critical.

It is also important that any person undergoing training is provided with sufficient on-job experience to enable them to gather the required evidence for assessment. Where an enterprise cannot provide for the full scope of work required then there may be a need to place the apprentice with another enterprise where that necessary experience and learning can be gained.

A cooperative agreement has been negotiated with a software provider where a proprietary web-based program will be available for recording workplace work experiences as they relate to the various units of competency. The data input is made by the apprentice, mainly using touch icons. This record is verified by their work supervisor, usually once per week, and it is then shared with the RTO who is delivering the training and assessment services. The program is already in use in Australian RTOs across a range of Training Package qualifications from a range of industries. The market price for the service is ~\$50 per student per year. Bulk discount rates are offered by the program developer. This modest fee provides a very useful service. The developer has agreed to provide a summary report of certain aspects of the work experience which can be collated into an historical record of the apprentice's experience.

It should be noted that this proprietary program uses cloud-based storage, is accessible using almost any computing device or interface, is secure and adheres to the Australian privacy regulations. IBSA Manufacturing has no commercial or other interest in the program. Use of this program is in no way mandatory.

Additionally, it is proposed that RTOs include a summary of work location and type with each apprentice's licence application, as this provides the Licensing Board with useful information about:

- where the apprentice has worked in the various stages of his/her apprenticeship (the nature of the business or of that part of the company, and the physical location);
- how long the apprentice was in that location; and
- the type of work in which the apprentice participated (e.g. 24/7 maintenance crew, or new construction installing work etc).



It is envisaged that the information available through these two initiatives will assist the assessment of licence applications.

Where an enterprise cannot provide for the full scope of work required then there may be a need to place the apprentice with another enterprise where that necessary experience and learning can be gained.

***Key features of the Industrial Electrician qualification and the industry that will impact on the selection of training pathways***

The qualification has been developed after a thorough consultation with enterprises that predominantly operate in industry sub-sectors of oil and gas, mining, production manufacturing and defence and provides competencies in the ability to select, set up and install, test, fault find, repair and maintain electrical systems and equipment in buildings and industrial environments including oil/gas installations, mine sites and processing plants.

The qualification is made up of a number of new units of competency, existing MEM05 units of competency, imported UEE units and an environmental unit. The qualification covers the Electrical Regulatory Authorities Council (ERAC) 66 'essential capabilities' and includes a standalone capstone assessment – MEM10025 Undertake a Capstone Assessment that addresses ERAC's 32 'critical capabilities'.

It is also important that any person undergoing training is provided with sufficient on-job experience to enable them to gather the required evidence for assessment and this record should be verified by their work supervisor, usually once a week and then can be shared with the RTO who is delivering training and assessment services. Where an enterprise cannot provide for the full scope of work required then there may be a need to place the apprentice with another enterprise where that necessary experience and learning can be gained.

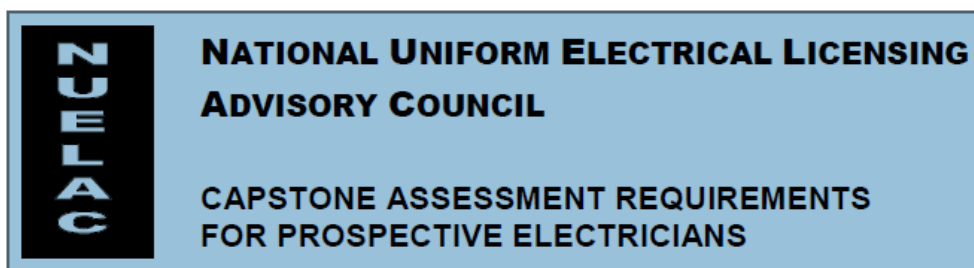
***Additional information relevant to implementation of MEM31219 Certificate III in Engineering - Industrial Electrician***

***Training delivery and assessment***

A Training Package qualification can not specify how the qualification is delivered. It can contain specific requirements for assessment (as mentioned above). As the move towards competency-based progression and completion in apprenticeships is better embraced, the relationship between on and off job training and assessment is even more critical.

The standard AQF requirements for assessment and qualifications for assessors must be observed. In addition, there are requirements of the electrical regulators. The following document must be considered when establishing the content and conditions for the capstone assessment:

**[Capstone Assessment Requirements for Prospective Electricians](#)**





All the NUELAC documents are available via the link below. Note that the local regulator may need to approve the RTO in accordance with these documents.

[http://www.erac.gov.au/index.php?option=com\\_content&view=article&id=97:uniform-electrician-licensing-across-australia&catid=82:news&Itemid=542](http://www.erac.gov.au/index.php?option=com_content&view=article&id=97:uniform-electrician-licensing-across-australia&catid=82:news&Itemid=542)

It is also important that any person undergoing training is provided with sufficient on-job experience to enable them to gather the required evidence for assessment. Where an enterprise cannot provide for the full scope of work required then there may be a need to place the apprentice with another enterprise where that necessary experience and learning can be gained.

Following endorsement of the new qualification, assistance and support will be provided for those RTOs wishing to add this new qualification to their scope including working with states and territories to have the new qualification aligned to Australian Apprenticeships requirements.

RTOs currently delivering engineering trade qualifications as well as perhaps electrotechnology should be able to extend their scope to cover this new qualification. Delivery and assessment of many units will require specialised equipment that may not be readily available in many RTOs. The enterprises involved in the development of the qualification have expressed willingness to support RTOs seeking to take up the new qualification by providing redundant plant and equipment for RTO use where these items may be available for such purposes.

Existing workers who have the required skills and knowledge as well as sufficient and appropriate recorded work experience can apply for recognition of prior learning against the units of competency in this new qualification.

## Mapping of Release 1 of the Industrial Electrician units to existing MEM05 electrical units

**Note:** This mapping relates to Release 1 of MEM31215 – historical reference only. The MEM05 units included in MEM Release 1 were replaced in MEM Release 2.0.

The new MEM Manufacturing and Engineering Training Package units of competency were developed specifically for the Certificate III in Engineering – Industrial Electrician qualification. Whilst there is some content duplication with existing MEM05 units, the new units are not equivalent and do not replace any existing MEM05 units.

New MEM Industrial Electrician Units	Related existing MEM Units (not replaced)	Comment
MEM10016 Terminate and test electrical wiring and accessories	MEM10002 Terminate and connect electrical wiring	Not equivalent. Does not replace existing units.
	MEM10011 Terminate and connect specialist cables	
MEM10018 Select cable types and sizes to suit loads and electrical installation environment		New Unit
MEM10019 Select circuit protection devices by type and rating, fit to switchboards and install earthing		New Unit
MEM10020 Install low voltage cabling and fit-off accessories, appliances and equipment		New Unit
MEM10021 Inspect, test and verify electrical installations		New Unit
MEM10022 Commission and decommission high and low voltage equipment or installations		New Unit
MEM10023 Design and connect control switching of circuits for building services and industrial equipment		New Unit
MEM10024 Install and trouble shoot luminaires and ancillary equipment		New Unit
MEM10025 Undertake a capstone assessment		New Unit
MEM13016 Work in hazardous areas		New unit
MEM13017 Apply safety practices, procedures and compliance standards associated with licensed electrical work		New Unit
MEM18100 Fault-find, test and rectify AC machines and circuits		

New MEM Industrial Electrician Units	Related existing MEM Units (not replaced)	Comment
MEM18102 Fault-find, test and rectify single and three-phase transformers	MEM18046 Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	Not equivalent. Does not replace existing units.
MEM18103 Fault-find, test and rectify electrical circuits and equipment	MEM18048 Fault find and repair/rectify basic electrical circuits	Not equivalent. Does not replace existing units.
	MEM18051 Fault find and repair/rectify complex electrical circuits	
MEM18104 Dismantle, replace and assemble electrical components and equipment	MEM18055 Dismantle, replace and assemble engineering components	Not equivalent. Does not replace existing unit.
MEM18105 Disconnect and reconnect high voltage fixed wired equipment	MEM18049 Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	Not equivalent. Does not replace existing units.
	MEM18050 Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	
MEM18106 Terminate communication and data cables	MEM18063 Terminate signal and data cables	Not equivalent. Does not replace existing unit.
MEM18108 Trouble shoot analog and digital electronic equipment		New unit
MEM18109 Trouble shoot instrumentation systems and equipment		New unit

## Mapping of MEM R1.2 units of competency – industrial electrician qualification

Note: MEM05 units were updated in MEM Release 2.0.

Unit code	Unit title	Prerequisites	Comment
MEM10016	Terminate and test electrical wiring and accessories	MEM10018 MEM18001C	Release 2.0 - equivalent
MEM10018	Select cable types and sizes to suit loads and electrical installation environment		Release 2.0 - equivalent
MEM10019	Select circuit protection devices by type and rating, fit to switchboards and install earthing	MEM10016 MEM10018 MEM18001C	Release 2.0 - equivalent
MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment	MEM10016 MEM10018 MEM10019 MEM10023A MEM10024 MEM18001C	Release 2.0 - equivalent
MEM10021	Inspect, test and verify electrical installations	MEM10016 MEM10018 MEM10019 MEM10020 MEM10022 MEM10023A MEM10024 MEM12023 MEM18001C MEM18100 MEM18102 MEM18103 MEM18104	Release 2.0 - equivalent
MEM10022	Commission and decommission high and low voltage equipment or installations		Release 2.0 - equivalent

Unit code	Unit title	Prerequisites	Comment
MEM10023	Design and connect control switching of circuits for building services and industrial equipment	MEM10016 MEM10018 MEM18001C	Release 2.0 - equivalent
MEM10024	Install and troubleshoot luminaires and ancillary equipment	MEM10016 MEM10018 MEM10019 MEM10023 MEM18001C	Release 2.0 - equivalent
MEM10025	Undertake a capstone assessment	MEM10016 MEM10018 MEM10019 MEM10020 MEM10021 MEM10022 MEM10023 MEM10024 MEM12023A MEM13014A MEM13017 MEM17003A MEM18001C MEM18100 MEM18102 MEM18103 MEM18104 UEENEEE101A UEENEEE104A UEENEEE107A UEENEEG102A	Release 2.0 - equivalent
MEM13016	Work in hazardous areas	MEM13014A	Release 2.0 - equivalent

Unit code	Unit title	Prerequisites	Comment
MEM13017	Apply safety practices, procedures and compliance standards associated with licensed electrical work	MEM13014A	Release 2.0 - equivalent
MEM18100	Fault-find, test and rectify AC machines and circuits	MEM10016 MEM10018 MEM10019 MEM10023 MEM12023A MEM18001C MEM18104	Release 2.0 - equivalent
MEM18102	Fault-find, test and rectify single and three-phase transformers	MEM10016 MEM10018 MEM10019 MEM12023A MEM18001C MEM18104	Release 2.0 - equivalent
MEM18103	Fault-find, test and rectify electrical circuits and equipment	MEM10016 MEM10018 MEM10019 MEM12023A MEM18001C MEM18100 MEM18102 MEM18104	Release 2.0 - equivalent
MEM18104	Dismantle, replace and assemble electrical components and equipment	MEM12023A MEM18001C	Release 2.0 - equivalent
MEM18105	Disconnect and reconnect high voltage fixed wired equipment	MEM10016 MEM10018 MEM18001C	Release 2.0 - equivalent
MEM18106	Terminate communication and data cables	MEM05001B MEM12023A MEM18001C	Release 2.0 - equivalent

Unit code	Unit title	Prerequisites	Comment
MEM18108	Troubleshoot analog and digital electronic equipment	MEM12023A MEM18001C MEM18104	Release 2.0 - equivalent
MEM18109	Troubleshoot instrumentation systems and equipment	MEM12023A MEM18001C MEM18104 MEM18108	Release 2.0 - equivalent

## Mapping of new 55 EPCs and changes to MEM units of competency – Release 1

### Background

In 2001 the National Uniform Electrical Licensing Advisory Council (NUELAC) developed 66 Essential Performance Capability (EPC) Requirements for Licensed Electricians and these have now been reviewed to ensure they are still relative and adequate. As a result, 55 updated Essential Performance Capabilities (EPCs) were developed, incorporating all the outcomes of the former EPCs. Since MEM31215 Certificate III in Engineering – Industrial Electrician was developed with the original 66 EPCs in mind a review of the qualification has been undertaken identify the changes required to the units to reflect the new 55 EPCs.

### Summary of changes required

The majority of the revised EPCs have little or no effect on the content or workplace outcomes of the existing MEM units of competency in MEM31219 Certificate III in Engineering Industrial Electrician. Refer to the attached mapping of the previous 66 EPCs to the new 55 EPCs.

Minor adjustments were required, as listed below.

EPC 16 – Knowledge of alternate earthing systems when required by local Regulatory Authorities included as part of Knowledge Evidence in MEM10019 and MEM10025

EPC 23 – Knowledge of minimum fault levels specified by electricity network operator included as part of Knowledge Evidence in MEM10019 and MEM10025

EPC 24 – Method of determining prospective fault current included as part of Performance and Knowledge Evidence of MEM10019. EPC 24 included in Knowledge Evidence in MEM10025 as EPC 24 is now Critical

EPC 26 – Need for calibration of instruments included as part of Knowledge Evidence in MEM10021. EPC26 included in Knowledge Evidence of MEM10025 as EPC 26 is now Critical

EPC 27 – Since the new EPC now includes specialist cables (old EPC 49) included as part of Knowledge Evidence of MEM10025

EPC 28 – Knowledge of additional training required to work competently with electrical equipment for hazardous areas included as part of Knowledge Evidence in MEM10020 and MEM10025

EPC 30 – Knowledge of reporting of test results included as part of Knowledge Evidence of MEM10025 since this has been included as part of this Critical EPC

EPC 31 – Knowledge and skills associated with capacitor banks included as part of Performance and Knowledge Evidence of MEM13017 and MEM10025

EPC 34 – Hazards and safety measures when working with adhesives and chemical fixing devices and safe work practices required for working with power and compressed gas operated tools included in Performance and Knowledge Evidence of MEM10016

EPC 42 – Knowledge and skills associated with asbestos awareness and reporting, and hazardous gases will need to be included in the Knowledge and Skills Evidence of UEENEEE101A. Precautions to be observed when drilling materials containing asbestos is already covered in Knowledge Evidence of MEM18104

EPC 44 – The Knowledge Evidence associated with this EPC included in Knowledge Evidence of MEM10025 and EPC 44 is now Critical



EPC 45 – The Knowledge and Skills associated with working safely at heights and in confined spaces and safe use of ladders and elevated platforms included in Performance and Knowledge Evidence of MEM13017

EPC 53 – National Construction Code (NCC) included in Range of Conditions of MEM10024

EPC 55 – The demonstrated knowledge and application of electricity generation systems and electricity converters and the requirements of the Wiring Rules for stand-alone and grid connected systems and the basic knowledge of battery storage systems and uninterruptible power supplies with included in the Performance and Knowledge Evidence of MEM13017 as this is a new EPC

### **Actions taken**

All relevant MEM units of competency have been updated to incorporate the revised 55 EPCs. In addition, the units listed below have had minor adjustments to content of Range of Conditions and Assessment Requirements.

MEM10016 – EPCs 34 and 35 evidence updated in Range of Conditions, Performance and Knowledge Evidence

MEM10018 – EPC 21 evidence updated in Knowledge Evidence

MEM10019 – EPCs 23 and 24 evidence updated in Knowledge Evidence

MEM10020 – EPCs 24, 25, 28, 29 and 35 evidence updated in Range of Conditions, Performance and Knowledge Evidence. In addition, new element 4 developed to fully encapsulate EPC 38

MEM10021 – EPC 26 evidence updated in PC 2.3, Performance and Knowledge Evidence

MEM10022 – EPC 29 added to ERAC requirements as this EPC relates to HV installations

MEM10024 – EPC 53 evidence updated in Range of Conditions and Knowledge Evidence

MEM10025 – Performance and Knowledge Evidence updated to reflect the new list of ‘critical’ EPCs.

## Mapping of 55 EPCs to previous 66 EPCs

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
1	Demonstrate a knowledge of basic electrical and energy concepts.	No change	1	UEENEEE104A	Solve problems in d.c. circuits	No effect
2 CRITICAL	Demonstrate a knowledge of the various effects of electric current.	No change	2	UEENEEE104A MEM10025	Solve problems in d.c. circuits Undertake a capstone assessment	No effect
3	Demonstrate a knowledge of resistivity and resistors.	No change	3	UEENEEE104A	Solve problems in d.c. circuits	No effect
4	Demonstrate a knowledge of the principles of various sources of electromotive force (e.m.f.).	limited to principles only	4	UEENEEE104A	Solve problems in d.c. circuits	No effect
5 CRITICAL	Explain the operation of a simple practical circuit. Determine the resistance, voltage, current and power in any part of a DC circuit using theory and actual measurement methods.	Combined with 6 expanded	5 + 6	UEENEEE104A MEM10025	Solve problems in d.c. circuits Undertake a capstone assessment	No effect
6	Demonstrate a knowledge of the theory and application of capacitors and inductors and their effects.	Combined with 10 expanded	7+10	UEENEEE104A UEENEEG102A	Solve problems in d.c. circuits Solve problems in low voltage a.c. circuits	No effect – Expanded evidence would normally be covered DC and AC principles
7	Demonstrate a knowledge of permanent and electromagnetic induction and application.	Combined with 9 expanded	8+9	UEENEEE104A UEENEEG102A	Solve problems in d.c. circuits Solve problems in low voltage a.c. circuits	No effect – Expanded evidence would normally be covered by magnetic theory and application
8 CRITICAL	Demonstrate a knowledge of alternating voltage & current generation, phase relationships, energy in an AC circuit, and actual measurement methods.	No change	11	UEENEEG102A MEM10025	Solve problems in low voltage a.c. circuits Undertake a capstone assessment	No effect
9	Introduction to star and delta three phase AC systems and the reason why three phase is used.	Minor edits	12	UEENEEG102A	Solve problems in low voltage a.c. circuits	No effect

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
10 CRITICAL	Demonstrate an understanding of the fundamental safety principles of AS/NZS 3000: Part 1. Knowledge of the hierarchy of standards. Normative / informative text.	Minor edits	13	MEM13017  MEM10025	Apply safety practices, procedures and compliance standards associated with licensed electrical work  Undertake a capstone assessment	No effect
11	Demonstrate a knowledge of power factor, power factor improvement principles and power measurement techniques in AC circuits in single and multiphase systems.	Minor edits	14	UEENEEG102A	Solve problems in low voltage a.c. circuits	No effect
12	Demonstrate the rationale and operating principles and characteristics of three phase induction motors and generators. Describe AS/NZ 3000 requirements and knowledge of local Supply Authority requirements for three phase motor installations and starters.	Combined with 17 expanded	15+17	MEM18100	Fault-find, test and rectify AC machines and circuits	Additional component 'including variable speed drives' covered' already covered in both Performance and Knowledge Evidence of MEM18100 – therefore no effect
13 CRITICAL	Demonstrate a knowledge of methods of electric motor selection, starting, connection and protection.	Minor edits	16	MEM18100  MEM10025	Fault-find, test and rectify AC machines and circuits  Undertake a capstone assessment	No effect
14	Demonstrate knowledge of possible causes of malfunction of three phase induction motors and demonstrate the tests required for diagnosing faults	Minor edits	18	MEM18100	Fault-find, test and rectify AC machines and circuits	As part of the normal fault finding process the ability to read and interpret wiring diagrams are an integral part of any fault diagnosis – therefore no effect
15	Describe the operating principles, characteristics, and suitability of typical	Combined with 20	19+20	MEM18100	Fault-find, test and rectify AC machines and circuits	Evidence indicated would normally be

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
	control methods for single-phase motors and their key components.	expanded				covered in the underpinning knowledge and skills for single phase motors – therefore no effect
16 CRITICAL	Demonstrate and apply in practice the requirements of AS/NZ 3000 in relation to earthing arrangements and fault loop impedance calculations. Knowledge of alternate earthing systems when required by local Regulatory Authorities.	Minor edits	21	MEM10019  MEM10025	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Undertake a capstone assessment	Knowledge of alternate earthing systems when required by local Regulatory Authorities included as part of the Knowledge Evidence of MEM10019 and MEM10025
17 CRITICAL	Demonstrate a comprehensive knowledge and understanding of the MEN system and its application, including on sub-installations. Demonstrate how to test an MEN system.	Minor edits	22	MEM10019  MEM10025	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Undertake a capstone assessment	Demonstrate how to test an MEM system is already a requirement of MEM10019 – therefore no effect
18	Describe the basic construction, principles of operation, and typical applications of the main types of transformers.	Combined with 24 and 25 expanded	23+24+ 25	MEM18102	Fault-find, test and rectify single and three-phase transformers	Applications already covered by MEM18102 – therefore no effect
19 CRITICAL	List the key safety issues of various types of transformers, including AS/NZS3000 requirements.	typical applications moved to EPC18	26	MEM18102  MEM10025	Fault-find, test and rectify single and three-phase transformers  Undertake a capstone assessment	No effect

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
20 CRITICAL	Demonstrate a knowledge of SELV and PELV systems, their application and testing in accordance with AS/NZS 3000	Minor edits	28	MEM10019  MEM10025	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Undertake a capstone assessment	Knowledge of earth leakage protection systems and their application whilst removed by this EPC is still covered by EPC 23 and included in MEM10019 – therefore no effect
21 CRITICAL	Demonstrate the ability to select cables for mains and submains using AS/NZS 3000 and AS/NZS 3008.1 based on current carrying capacity, short circuit capacity, maximum demand and voltage drop, for single phase and three phase installations including multiple installations.	Minor edits	29	MEM10018  MEM10025	Select cable types and sizes to suit loads and electrical installation environment  Undertake a capstone assessment	Fault loop impedance is covered in the underpinning knowledge and skills in MEM10018 – therefore no effect
22 CRITICAL	Demonstrate the ability to select cables for final subcircuits using AS/NZS 3000 and AS/NZS 3008.1 based on current carrying capacity, short circuit capability, maximum demand, earth loop impedance and voltage drop.	No change	30	MEM10018  MEM10025	Select cable types and sizes to suit loads and electrical installation environment  Undertake a capstone assessment	No effect
23 CRITICAL	Describe and apply the control and protection requirements for installations and equipment. Demonstrate the ability to select suitable equipment and switchgear for a particular installation or part of an installation using AS/NZS3000	Combined with 27 expanded	31+27	MEM10019  MEM10025	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Undertake a capstone assessment	Knowledge of minimum fault levels specified by electricity network operator added to the Knowledge Evidence of MEM10019 and MEM10025

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
24 CRITICAL	Demonstrate an understanding of the AS/NZS 3000 and regulatory requirements for the location of switchboards and arrangement of switchboard equipment in installations. Methods for determining prospective fault current. Switchboard form types.	Now critical expanded	32	MEM10019  MEM10020	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Install low voltage cabling and fit-off accessories, appliances and equipment	Method of determining prospective fault current added to both Performance and Knowledge Evidence of MEM10019  Switchboard form types is covered by Knowledge Evidence of MEM10019  EPC included in MEM10025 Knowledge Evidence as EPC now Critical
25 CRITICAL	Demonstrate an understanding of the AS/NZS 3000 and regulatory requirements for the installation of electrical equipment in damp situations and wet areas. IP rating of electrical equipment.	Minor edits	33	MEM10020  MEM10025	Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	IP rating of electrical equipment is covered under Knowledge Evidence of MEM10020 – therefore no effect
26 CRITICAL	Demonstrate the appropriate methods for the installation, modification and testing of electrical installations and equipment for construction and demolition sites, complying with AS/NZS 3012 and applicable workplace safety legislation. Need for calibration of instruments.	Minor edits	34	MEM10019  MEM10020  MEM10021	Select circuit protection devices by type and rating, fit to switchboards and install earthing  Install low voltage cabling and fit-off accessories, appliances and equipment  Inspect, test and verify electrical installations	Need for calibration of instruments added to Knowledge Evidence of MEM10021 and MEM10025 as EPC is Critical

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
				MEM10025	Undertake a capstone assessment	
27 CRITICAL	Demonstrate knowledge of AS/NZS 3000 and local regulatory requirements for the installation of aerial conductors and underground wiring. Including specialist cables.	Combined with 49 expanded	35+49	MEM10016  MEM10018  MEM10020  MEM10025	Terminate and test electrical wiring and accessories  Select cable types and sizes to suit loads and electrical installation environment  Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	Specialist cables (old EPC 49) added to the Performance and Knowledge Evidence of MEM10025
28 CRITICAL	Demonstrate a knowledge of the AS/NZS 3000 requirements for electrical installations in hazardous areas and an awareness of the standards to which it refers	Minor edits	36	MEM10020  MEM10025	Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	Knowledge of additional training required to work competently with electrical equipment for hazardous areas added to the Knowledge Evidence of both MEM10020 and MEM10025
29	Knowledge of AS/NZS 3000 requirements for safety services and issues relevant to HV installations. Standards referenced for electrical installations related to transportable structures and vehicles, shows and carnivals, patient areas, marinas and boats, and construction/demolition sites.	Minor edits	37	MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment	Knowledge Evidence of MEM10020 covers requirements for special installations – therefore no effect
30 CRITICAL	Demonstrate to AS/NZS 3000 and AS/NZS 3017 standards the electrical checks and tests required to ensure electrical installations are safe, reporting of test	Combined with 39 and 46	38+39+46	MEM10021  MEM10025	Inspect, test and verify electrical installations  Undertake a capstone assessment	Knowledge of reporting of test results added to the Knowledge Evidence

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
	results typically required to satisfy regulatory requirements.					of MEM10025 now that it has been included as part of this Critical EPC
31 CRITICAL	Demonstrate the knowledge and skill to perform effective safe isolation of any equipment, including switch and lock off, circuit isolation, equipment testing and tag out procedures, including capacitor banks.	Minor edits	40	MEM13017  MEM10025	Apply safety practices, procedures and compliance standards associated with licensed electrical work  Undertake a capstone assessment	Knowledge and skill associated with effective safe isolation of capacitor banks added to both the Performance and Knowledge Evidence of MEM13017 and MEM10025
32	Describe the construction, specifications, colour coding and application of various types of cords and cables.	No change	41	MEM10016	Terminate and test electrical wiring and accessories	No effect
33	Demonstrate the skill to prepare and terminate cords and cables.	No change	42	MEM10016	Terminate and test electrical wiring and accessories	No effect
34	Demonstrate the knowledge and skills for selection and attachment of electrical accessories, using appropriate fixing devices, tools and methods.	Minor edits	43	MEM10016	Terminate and test electrical wiring and accessories	Performance and Knowledge Evidence of MEM10016 includes EPC component and Evidence
35 CRITICAL	Demonstrate the knowledge and skills to install and terminate a variety of electrical cables in a wide range of applications (including final subcircuits) to AS/NZS3000	Minor edits	44	MEM10016  MEM10020  MEM10025	Terminate and test electrical wiring and accessories  Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	Installation and termination requirements across a variety of cables is already covered in MEM10016 and MEM10020 – therefore no effect.



New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
36	Demonstrate the knowledge and skills for the installation of wiring support systems.	No change	45	MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment	No effect
37 CRITICAL	Demonstrate knowledge and skills to install final subcircuit wiring into switchboards and connect to switchboard equipment in accordance with AS/NZS 3000 and local supply authority requirements.	Minor edits	47	MEM10020  MEM10025	Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	Performance evidence of MEM10020 covers the demonstration of knowledge and skills to install – therefore no effect
38 CRITICAL	Connect consumers mains to an installation, in accordance with AS/NZS 3000 and local supply authority requirements.	Minor edits	48	MEM10020  MEM10025	Install low voltage cabling and fit-off accessories, appliances and equipment  Undertake a capstone assessment	Minor edits are covered by MEM10020 – therefore no effect
39	Determine and apply AS/NZS 3000 requirements for the installing, terminating and testing of catenary supported cables, pendant-type socket outlets and trailing cables.	No change	50	MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment	No effect
40 CRITICAL	Demonstrate ability to read, sketch and interpret electrical diagrams and specifications.	Minor edits	51	UEENEEE107A  MEM10025	Use drawings, diagrams, schedules, standards, codes and specifications  Undertake a capstone assessment	The addition of specifications is already covered by UEENEEE107A – therefore no effect
41	Demonstrate the knowledge and skills to design and connect switching circuits, as per AS/NZS 3000.	Minor edits	52	MEM10023	Design and connect control switching of circuits for building services and industrial equipment	Performance evidence of MEM10023 covers the demonstration of knowledge and skills to design etc., – therefore no effect
42	Describe basic statutory occupational safety	Edits to	53	UEENEEE101A		

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
CRITICAL	and health responsibilities for employers and employees, including supervisory requirements and employees' own "duty of care". Asbestos awareness and reporting. Hazardous gases.	add gases and asbestos		MEM10025	Undertake a capstone assessment	
43 CRITICAL	Demonstrate understanding of the requirements for personal safety in the workplace and application of safety practices.	Minor edits	54	MEM13017  MEM10025	Apply safety practices, procedures and compliance standards associated with licensed electrical work  Undertake a capstone assessment	Selection and use of fire extinguishers is covered in the Knowledge Evidence of MEM13017 – therefore no effect
44 CRITICAL	Describe a workplace safety check, identify potential workplace hazards and suggest measures for accident prevention.	Now critical	55	UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace	EPC included in MEM10025 in Knowledge Evidence as EPC now Critical
45	Demonstrate the knowledge and practices that are essential for working safely with electrical equipment and tools, for safe manual handling, working safely at heights and in confined spaces. Knowledge of testing and tagging procedures to AS/NZS 3760.	Minor edits	56	MEM13015  MEM13017	Work safely and effectively in manufacturing and engineering Apply safety practices, procedures and compliance standards associated with licensed electrical work	The Performance and Knowledge Evidence of MEM13017 strengthened to include working safely at heights and in confined spaces, safe use of ladders and elevated platforms
46 CRITICAL	Describe the method of rescuing a person in contact with live electrical conductors or equipment.	No change	57	UEENEEE101A  MEM10025	Apply Occupational Health and Safety regulations, codes and practices in the workplace  Undertake a capstone assessment	No effect

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
47 CRITICAL	Describe the emergency first aid requirements for an electric shock victim and demonstrate the knowledge and application skill of CPR.	No change	58	UEENEEE101A  MEM10025	Apply Occupational Health and Safety regulations, codes and practices in the workplace  Undertake a capstone assessment	No effect
48 CRITICAL	Demonstrate knowledge and understanding of the significant dangers of High Voltage equipment and distribution systems.	No change	59	MEM18102  MEM10025	Fault-find, test and rectify single and three-phase transformers  Undertake a capstone assessment	No effect
49	Describe the types of potential operational situations that may be encountered in various areas of industry and the type of assistance that may be needed from more experienced industry personnel.	Combined with 61 expanded	60+61	MEM10022	Commission and decommission high and low voltage equipment or installations	Knowledge Evidence of MEM10022 includes the evidence aspects of this EPC – therefore no effect
50 CRITICAL	Describe methods of commissioning and/or decommissioning electrical equipment or an installation, using a systems approach.	Minor edits	62	MEM10022  MEM10025	Commission and decommission high and low voltage equipment or installations  Undertake a capstone assessment	MEM10022 covers commissioning and/or decommissioning of electrical equipment or an installation – therefore no effect
51	Describe the functioning of basic electronic circuits used in common electrical power circuit applications, including electronic logic controls, related hazards and safety requirements.	Minor edits	63	MEM10023	Design and connect control switching of circuits for building services and industrial equipment	Electronic logic controls is covered in both the Performance and Knowledge Evidence of MEM10023 – therefore no effect
52	Describe basic control techniques for DC loads. Includes control and diagnostic methods for simple DC motor control circuits and applications.	Minor edits	64	UEENEEG101A	Solve problems in electromagnetic devices and related circuits	UEENEEG101A covers the evidence of this EPC – therefore no effect

New EPC #	EPC Title	Tracking / Notes	Old EPC #	Unit code/s where old EPC	Unit title	Comments/ Gap
53	Demonstrate an understanding of the basic operation and energy efficiency of various types of luminaires, and the purpose of components and ancillary equipment, including related hazards and their safety requirements.	Expanded to include NCC & NZ building code	65	MEM10024	Install and troubleshoot luminaires and ancillary equipment	The Range of Conditions of MEM10024 now includes NCC and NZ building code
54 CRITICAL	Demonstrate the knowledge and skills for diagnosing and rectifying faults in electrical apparatus and associated circuits.	No change	66	MEM18103  MEM10025	Fault-find, test and rectify electrical circuits and equipment  Undertake a capstone assessment	No effect
55	Demonstrate knowledge and application of electricity generation systems and electricity converters and the requirements of AS/NZS 3000 Wiring Rules for stand-alone and grid connected systems. Basic knowledge of battery storage systems and uninterruptible power supplies.	New	New	MEM13017	Apply safety practices, procedures and compliance standards associated with licensed electrical work	The requirements of this EPC have been added to the Performance and Knowledge evidence of MEM13017.

\*Pink = Critical

The over-arching objective is that the training for a prospective electrician must deliver at least the “essential performance capability” requirements, and that the capstone assessment will confirm that the most critical of these, highlighted in the table, has been attained by the applicant.