



**Australian Government**

# **MEM40119 Certificate IV in Engineering**

**Release 1**

# MEM40119 Certificate IV in Engineering

## Modification History

Release 1. Supersedes and is equivalent to MEM40105 Certificate IV in Engineering

## Qualification Description

This qualification defines the skills and knowledge required for a higher engineering tradesperson within metal, engineering, manufacturing and associated industries.

The skills associated with this qualification are intended to apply to 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, plant mechanics, marine electronics, mechatronics, patternmaking, robotics, toolmaking, welding and watch and clock services and repair, including post-trade work.

It provides the skills and knowledge for a person to understand and implement quality control techniques, exercise good interpersonal and communications skills, work from complex instructions and procedures, exercise discretion within the scope of responsibility, perform work under limited supervision either individually or in a team environment, be responsible for assuring the quality of their own work, provide trade guidance and assistance as part of a work team, perform non-trade tasks which are incidental or peripheral to the primary tasks and facilitate the completion of the whole task, inspect products and/or materials for conformity with established operational standards, operate lifting equipment incidental to their work and assists in the provision of training in conjunction with supervisors and trainers.

This qualification may be accessed by direct entry. While there is no qualification entry requirement, it is assumed that the learner is either already a tradesperson with access to structured 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 specifically designed to cover the skills and knowledge required of workers employed as Engineering/Manufacturing Tradesperson – Special Class Level II as defined in the Manufacturing and Associated Industries and Occupations Award.

No licensing, legislative or certification requirements apply to this qualification at the time of publication. However, in some jurisdictions units in this qualification may require a license. Licensing information is included in the relevant units of competence.

The following additional descriptors are approved for use with this qualification:

- Casting and Moulding
- CNC Programming
- Fluid Power
- Boilermaking
- Instrumentation
- Maintenance
- Fixed and Mobile Plant Mechanic

- Mechatronics
- Patternmaking
- Refrigeration and Air Conditioning
- Marine Craft Construction
- Robotics
- Sheet Metal
- Toolmaking
- Watch and Clock Service and Repair
- Welding

No other descriptor can be used.

## Entry Requirements

There are no entry requirements for this qualification.

## Packaging Rules

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

- 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.

Appropriate Group B elective units to the value of 14 points may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available for inclusion in Certificate III and Certificate IV qualifications. Only select units that would be suitable for occupational outcomes in a higher engineering trade environment.

Registered Training Organisations (RTOs) must seek a determination from the industry parties in respect of the allocation of points values for units of competency drawn from other Training Packages or accredited courses. Determination of points requests are to be submitted to the industry parties through Innovation and Business Skills Australia (IBSA) Manufacturing. Refer to the MEM Companion Volume Implementation Guide for information on determination of unit points values.

### Prerequisites

Points associated with prerequisites count towards the total. Units with prerequisite requirements are marked with an asterisk (refer to the individual units for details). All prerequisites are included in the units listed.

### Core units of competency

Unit code	Unit title	P	Pre req
MEM09002	Interpret technical drawing	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM11011	Undertake manual handling	2	*
MEM12023	Perform engineering measurements	5	*
MEM12024	Perform computations	3	*
MEM13015	Work safely and effectively in manufacturing and engineering	2	
MEM14006	Plan work activities	4	*
MEM16006	Organise and communicate information	2	*
MEM16008	Interact with computing technology	2	*
MEM17003	Assist in the provision of on-the-job training	2	*
MEM18001	Use hand tools	2	*
MEM18002	Use power tools/hand held operations	2	*
MSMENV272	Participate in environmentally sustainable work practices	3	

Elective units of competency

Group A

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM04020	Supervise individual ferrous melting and casting operation	4	*
MEM04021	Supervise individual non-ferrous melting and casting operation	4	*
MEM04022	Examine appropriateness of methoding for mould design	4	*
MEM04023	Undertake prescribed tests on foundry-related materials	4	*
MEM05024	Perform welding supervision	12	*
MEM05025	Perform welding/fabrication inspection	12	*
MEM05026	Apply welding principles	4	*
MEM05042	Perform welds to code standards using flux core arc welding process	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM05043	Perform welds to code standards using gas metal arc welding process	6	*
MEM05044	Perform welds to code standards using gas tungsten arc welding process	6	*
MEM05045	Perform pipe welds to code standards using manual metal arc welding process	6	*
MEM05046	Perform welds to code standards using manual metal arc welding process	6	*
MEM05053	Set and edit computer controlled thermal cutting machines	4	*
MEM05054	Write basic NC/CNC programs for thermal cutting machines	4	*
MEM05058	Perform welds to code standards using oxy fuel gas welding process	6	*
MEM07016	Set and edit computer controlled machines and processes	4	*
MEM07018	Write basic NC and CNC programs	4	*
MEM07019	Program NC and CNC machining centre	2	*
MEM07020	Program multiple spindle and multiple axis NC and CNC machining centre	2	*
MEM07022	Program CNC wire cut machines	2	*
MEM07023	Program and set up CNC manufacturing cell	6	*
MEM07039	Write programs for industrial robots	4	*
MEM09004	Perform electrical or electronic detail drafting	8	*
MEM09006	Perform advanced engineering detail drafting	4	*
MEM09007	Perform advanced mechanical detail drafting	4	*
MEM09008	Perform advanced structural detail drafting	4	*
MEM09009	Create 2-D drawings using computer-aided design system	8	*
MEM09010	Create 3-D models using computer-aided design system	4	*
MEM09023	Create 3-D code files using computer-aided manufacturing system	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM10007	Modify control systems	6	*
MEM10008	Undertake commissioning procedures for plant and/or equipment	4	*
MEM12003	Perform precision mechanical measurement	2	*
MEM12004	Perform precision electrical/electronic measurement	4	*
MEM12005	Calibrate measuring equipment	6	*
MEM12025	Use graphical techniques and perform simple statistical computations	2	*
MEM12026	Perform advanced trade calculations in a manufacturing, engineering or related environment	4	*
MEM14001	Schedule material deliveries	8	*
MEM14002	Undertake basic process planning	8	*
MEM14003	Undertake production scheduling	8	*
MEM15007	Conduct product and/or process capability studies	6	*
MEM15008	Perform advanced statistical quality control	2	*
MEM15010	Perform laboratory procedures	8	*
MEM15011	Exercise external quality assurance	6	*
MEM15012	Maintain/supervise the application of quality procedures	4	*
MEM15015B	Examine trading practices	5	*
MEM15016B	Inspect pre-packed articles	8	*
MEM15017B	Use and maintain reference standards	3	*
MEM15018B	Investigate consumer complaints	6	*
MEM15019B	Conduct a field inspection	12	*
MEM15020C	Perform verification/certification or in-service inspection	12	*
MEM15021C	Conduct audits of servicing licensees and public weighbridge licensees	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM15022B	Verify reference standards	8	*
MEM16001	Give formal presentations and take part in meetings	2	*
MEM16003	Provide advanced customer service	2	*
MEM16009	Research and analyse engineering information	2	*
MEM16010	Write reports	2	*
MEM16011	Communicate with individuals and small groups	2	*
MEM16012	Interpret technical specifications and manuals	4	*
MEM16013	Operate in a self-directed team	2	*
MEM16014	Report technical information	2	*
MEM17001	Assist in development and deliver training in the workplace	2	*
MEM17002	Conduct workplace assessment	2	*
MEM18010	Perform equipment condition monitoring and recording	4	*
MEM18011	Shut down and isolate machines/equipment	2	*
MEM18016	Analyse plant and equipment condition monitoring results	4	*
MEM18017	Modify mechanical systems and equipment	8	*
MEM18019	Maintain pneumatic systems	4	*
MEM18021	Maintain hydraulic systems	4	*
MEM18022	Maintain fluid power controls	8	*
MEM18023	Modify fluid power system operation	8	*
MEM18049	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3	*
MEM18050	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	3	*
MEM18053	Modify fluid power control systems	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM18054	Fault find, test and calibrate instrumentation systems and equipment	8	*
MEM18056	Diagnose and repair analog equipment and components	10	*
MEM18058	Modify electronic equipment	4	*
MEM18059	Modify electronic systems	4	*
MEM18060	Maintain, repair control instrumentation - single and multiple loop control systems	8	*
MEM18061	Maintain/calibrate complex control systems	8	*
MEM18062	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	8	*
MEM18065	Diagnose and repair digital equipment and components	10	*
MEM18066	Diagnose and repair microprocessor-based equipment	6	*
MEM18067	Tune control loops - multi controller or multi element systems	6	*
MEM18069	Maintain, repair instrumentation process control analysers	6	*
MEM18091	Maintain and repair multistage, cascade and/or ultra-cold industrial refrigeration systems	4	*
MEM18092	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	6	*
MEM18093	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	8	*
MEM20008	Develop and implement a masterkey system	6	*
MEM20011	Service and repair fire and security containers	6	*
MEM20012	Service and repair mechanical automotive locking systems	4	*
MEM20013	Service automotive transponder systems	2	*
MEM21018	Service clock escapements and oscillating systems	4	*
MEM21019	Service and repair clock striking mechanisms	4	*
MEM21020	Service and repair clock chiming mechanisms	6	*



<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM21021	Restore clockwork mechanisms	6	*
MEM21022	Manufacture watch and clock components	6	*
MEM21023	Plan, set up and operate horological workshop or service centre	4	*
MEM24002B	Perform penetrant testing	4	*
MEM24004B	Perform magnetic particle testing	4	*
MEM24006B	Perform eddy current testing	6	*
MEM24008B	Perform ultrasonic testing	6	*
MEM24010B	Perform radiographic testing	6	*
MEM24011B	Establish non-destructive tests	12	*
MEM24012C	Apply metallurgy principles	4	*
MEM25008	Repair marine vessel surfaces and structures	4	*
MEM25013	Produce three-dimensional plugs/moulds	12	*
MEM27018	Test, diagnose and rectify mobile and stationary plant external monitoring and control systems	4	*
MEM27024	Diagnose and rectify mobile plant hydrostatic systems	4	*
MEM27027	Install or modify mobile plant air conditioning systems	4	*
MSATCM304A	Interpret basic binary phase diagrams	4	

## Group B

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM03001	Perform manual production assembly	4	*
MEM03002	Perform precision assembly	4	*
MEM03003	Perform sheet and plate assembly	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM03004	Perform electronic/electrical assembly (production)	8	*
MEM03005	Rework and repair (electrical/electronic production)	8	*
MEM03006	Set assembly stations	2	*
MEM04001	Operate melting furnaces	4	*
MEM04002	Perform gravity die casting	2	*
MEM04003	Operate pressure die casting machine	4	*
MEM04004	Prepare and mix sand for metal moulding	4	*
MEM04006	Operate sand moulding and core making machines	8	*
MEM04007	Pour molten metal	4	*
MEM04008	Fettle and trim metal castings/forgings	4	*
MEM04010	Develop and manufacture wood patterns	20	*
MEM04011	Produce polymer patterns	8	*
MEM04012	Assemble plated patterns	8	*
MEM04013	Develop and manufacture polystyrene patterns	2	*
MEM04014	Develop and manufacture production patterns	8	*
MEM04015	Develop and manufacture vacuum forming moulds and associated equipment	6	*
MEM04016	Develop and manufacture precision models	6	*
MEM04017	Develop and manufacture gear, conveyor screw and propeller patterns	4	*
MEM04018	Perform general woodworking machine operations	4	*
MEM04019	Perform refractory installation and repair	4	*
MEM04024	Produce moulds and cores by hand	4	*
MEM04025	Produce moulds and cores by hand (advanced)	12	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM05001	Perform manual soldering/desoldering - electrical/electronic components	4	*
MEM05002	Perform high reliability soldering and desoldering	4	*
MEM05003	Perform soft soldering	2	*
MEM05004	Perform routine oxy fuel gas welding	2	*
MEM05005	Carry out mechanical cutting	2	*
MEM05006	Perform brazing and/or silver soldering	2	*
MEM05007	Perform manual heating and thermal cutting	2	*
MEM05008	Perform advanced manual thermal cutting, gouging and shaping	2	*
MEM05009	Perform automated thermal cutting	2	*
MEM05010	Apply fabrication, forming and shaping techniques	8	*
MEM05011	Assemble fabricated components	8	*
MEM05012	Perform routine manual metal arc welding	2	*
MEM05013	Perform manual production welding	2	*
MEM05014	Monitor quality of production welding/fabrications	2	*
MEM05015	Weld using manual metal arc welding process	4	*
MEM05016	Perform advanced welding using manual metal arc welding process	4	*
MEM05017	Weld using gas metal arc welding process	4	*
MEM05018	Perform advanced welding using gas metal arc welding process	4	*
MEM05019	Weld using gas tungsten arc welding process	4	*
MEM05020	Perform advanced welding using gas tungsten arc welding process	4	*
MEM05022	Perform advanced welding using oxy acetylene welding process	6	*
MEM05023	Weld using submerged arc welding process	4	*
MEM05036	Repair, replace and/or modify fabrications	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM05037	Perform geometric development	6	*
MEM05038	Perform advanced geometric development - cylindrical/rectangular	2	*
MEM05039	Perform advanced geometric development - conical	2	*
MEM05040	Perform advanced geometric development - transitions	4	*
MEM05041	Weld using flame powder spraying	4	*
MEM05047	Weld using flux core arc welding process	4	*
MEM05048	Perform advanced welding using flux core arc welding process	4	*
MEM05049	Perform routine gas tungsten arc welding	2	*
MEM05050	Perform routine gas metal arc welding	2	*
MEM05051	Select welding processes	2	*
MEM05052	Apply safe welding practices	4	*
MEM05055	Weld using oxy fuel gas welding process	4	*
MEM05056	Perform routine flux core arc welding	2	*
MEM05057	Perform routine submerged arc welding	2	*
MEM06001	Perform hand forging	4	*
MEM06002	Perform hammer forging	4	*
MEM06003	Carry out heat treatment	6	*
MEM06004	Select heat treatment processes and test finished product	6	*
MEM06005	Perform drop and upset forging	4	*
MEM06006	Repair springs	4	*
MEM06007	Perform basic incidental heat/quenching, tempering and annealing	2	*
MEM06008	Hammer forge complex shapes	4	*
MEM06009	Hand forge complex shapes	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM07001	Perform operational maintenance of machines/equipment	2	*
MEM07002	Perform precision shaping/planing/slotting operations	4	*
MEM07003	Perform routine machine setting	4	*
MEM07004	Perform complex machine setting	8	*
MEM07005	Perform general machining	8	*
MEM07006	Perform lathe operations	4	*
MEM07007	Perform milling operations	4	*
MEM07008	Perform grinding operations	4	*
MEM07009	Perform precision jig boring operations	4	*
MEM07010	Perform tool and cutter grinding operations	4	*
MEM07011	Perform complex milling operations	4	*
MEM07012	Perform complex grinding operations	4	*
MEM07013	Perform machining operations using horizontal and vertical boring machines	4	*
MEM07014	Perform electro-discharge machining (EDM) operations	4	*
MEM07015	Set computer controlled machines and processes	2	*
MEM07021	Perform complex lathe operations	4	*
MEM07024	Operate and monitor machine and process	4	*
MEM07025	Perform advanced machine and process operation	6	*
MEM07026	Perform advanced plastic processing	6	*
MEM07027	Perform advanced press operations	6	*
MEM07028	Operate computer controlled machines and processes	2	*
MEM07029	Perform routine sharpening and maintenance of production tools and cutters	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM07030	Perform basic metal spinning lathe operations	8	*
MEM07031	Perform complex metal spinning lathe operations	4	*
MEM07032	Use workshop machines for basic operations	2	*
MEM07033	Operate and monitor basic boiler	6	*
MEM07040	Set multistage integrated processes	6	*
MEM08001	Perform wire, jig and barrel load/unload work	4	*
MEM08002	Pre-treat work for subsequent surface coating	4	*
MEM08003	Perform electroplating operations	6	*
MEM08004	Finish work using wet, dry and vapour deposition methods	4	*
MEM08005	Prepare and produce specialised coatings	4	*
MEM08006	Produce clear and/or coloured and/or sealed anodised films on aluminium	2	*
MEM08007	Control surface finish production and finished product quality	4	*
MEM08008	Operate and control surface finishing waste treatment process	3	*
MEM08009	Make up solutions	2	*
MEM08010	Manually finish/polish materials	6	*
MEM08011	Prepare surfaces using solvents and/or mechanical means	2	*
MEM08012	Prepare surfaces by abrasive blasting (basic)	4	*
MEM08013	Prepare surfaces by abrasive blasting (advanced)	4	*
MEM08014	Apply protective coatings (basic)	4	*
MEM08015	Apply protective coatings (advanced)	4	*
MEM08016	Control blast coating by-products, materials and emissions	1	*
MEM08018	Electroplate engineering coatings	6	*
MEM08019	Electroplate protective finishes	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM08020	Electroplate decorative finishes	6	*
MEM09003	Prepare basic engineering drawing	8	*
MEM09005	Perform basic engineering detail drafting	8	*
MEM09011	Apply basic engineering design concepts	6	*
MEM09021	Interpret and produce drawings of curved 3-D shapes	4	*
MEM09022	Create 2-D code files using computer-aided manufacturing system	4	*
MEM10001	Erect structures	4	*
MEM10002	Terminate and connect electrical wiring	3	*
MEM10004	Enter and change programmable controller operational parameters	2	*
MEM10005	Commission programmable controller programs	4	*
MEM10006	Install machine/plant	4	*
MEM10009	Install refrigeration and air conditioning plant and equipment	4	*
MEM10010	Install pipework and pipework assemblies	4	*
MEM10011	Terminate and connect specialist cables	3	*
MEM10013	Install split air conditioning systems and associated pipework	6	*
MEM11001	Erect/dismantle scaffolding and equipment	4	*
MEM11002	Erect/dismantle intermediate scaffolding and equipment	4	*
MEM11003	Coordinate erection/dismantling of complex scaffolding/equipment	4	*
MEM11004	Undertake dogging	4	*
MEM11005	Pick and process order	4	*
MEM11006	Perform production packaging	2	*
MEM11007	Administer inventory procedures	4	*
MEM11008	Package materials (stores and warehouse)	2	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM11009	Handle/move bulk fluids/gases	4	*
MEM11010	Operate mobile load shifting equipment	4	*
MEM11012	Purchase materials	6	*
MEM11013	Undertake warehouse receipt process	4	*
MEM11014	Undertake warehouse dispatch process	4	*
MEM11015	Manage warehouse inventory system	6	*
MEM11016	Order materials	2	*
MEM11017	Organise and lead stocktakes	4	*
MEM11018	Organise and maintain warehouse stock receipt and dispatch system	6	*
MEM11019	Undertake tool store procedures	4	*
MEM11020	Perform advanced warehouse computer operations	4	*
MEM11021	Perform advanced operation of load shifting equipment	2	*
MEM11022	Operate fixed/movable load shifting equipment	4	*
MEM12001	Use comparison and basic measuring devices	2	*
MEM12002	Perform electrical/electronic measurement	2	*
MEM12006	Mark off/out (general engineering)	4	*
MEM12007	Mark off/out structural fabrications and shapes	4	*
MEM12019	Measure components using coordinate measuring machines	4	*
MEM12020	Set and operate coordinate measuring machines	2	*
MEM12021	Program coordinate measuring machines	4	*
MEM12022	Program coordinate measuring machines (advanced)	2	*
MEM13001	Perform emergency first aid	1	*
MEM13002	Undertake work health and safety activities in the workplace	3	*



<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM13003	Work safely with industrial chemicals and materials	2	*
MEM13004	Work safely with molten metals/glass	2	*
MEM13006	Collect and evaluate work health and safety data for an enterprise or section of an enterprise	4	*
MEM13007	Maintain water treatment systems for cooling towers	2	*
MEM13010	Supervise work health and safety in an industrial work environment	4	*
MEM13013	Work safely with ionizing radiation	4	*
MEM15001	Perform basic statistical quality control	2	*
MEM15003	Use improvement processes in team activities	4	*
MEM15004	Perform inspection	2	*
MEM15005	Select and control inspection processes and procedures	4	*
MEM16002	Conduct formal interviews and negotiations	4	*
MEM16004	Perform internal/external customer service	2	*
MEM16005	Operate as a team member to conduct manufacturing, engineering or related activities	2	*
MEM18003	Use tools for precision work	4	*
MEM18004	Maintain and overhaul mechanical equipment	4	*
MEM18005	Perform fault diagnosis, installation and removal of bearings	4	*
MEM18006	Perform precision fitting of engineering components	6	*
MEM18007	Maintain and repair mechanical drives and mechanical transmission assemblies	4	*
MEM18008	Balance equipment	2	*
MEM18009	Perform precision levelling and alignment of machines and engineering components	4	*
MEM18012	Perform installation and removal of mechanical seals	2	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM18013	Perform gland packing	2	*
MEM18014	Manufacture press tools and gauges	8	*
MEM18015	Maintain tools and dies	4	*
MEM18018	Maintain pneumatic system components	4	*
MEM18020	Maintain hydraulic system components	4	*
MEM18045	Fault find and repair electrical equipment/components up to 250 volts single phase supply	4	*
MEM18046	Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	10	*
MEM18055	Dismantle, replace and assemble engineering components	3	*
MEM18057	Maintain/service analog/digital electronic equipment	6	*
MEM18063	Terminate signal and data cables	4	*
MEM18064	Maintain instrumentation system components	6	*
MEM18071	Connect and disconnect fluid conveying system components	2	*
MEM18072	Manufacture fluid conveying conductor assemblies	4	*
MEM18083	Handle fluorocarbon refrigerants according to regulations	1	*
MEM18084	Commission and decommission split air conditioning systems	4	*
MEM18085	Install, service and repair domestic air conditioning and refrigeration appliances	6	*
MEM18086	Test, recover, evacuate and charge refrigeration systems	4	*
MEM18087	Service and repair domestic and light commercial refrigeration and air conditioning equipment	6	*
MEM18088	Maintain and repair commercial air conditioning systems and components	4	*
MEM18089	Maintain and repair central air handling systems	6	*
MEM18090	Maintain and repair industrial refrigeration systems and components	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM18094	Service and repair commercial refrigeration	6	*
MEM18095	Maintain and repair cooling towers/evaporative condensers and associated equipment	4	*
MEM18096	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	6	*
MEM18097	Manufacture cavity dies	8	*
MEM18098	Prepare to perform work associated with fuel system installation and servicing	2	*
MEM19001	Perform jewellery metal casting	6	*
MEM19002	Prepare jewellery illustrations	4	*
MEM19003	Handle gem materials	2	*
MEM19004	Handle and examine gemstone materials	6	*
MEM19005	Produce three-dimensional precision items	8	*
MEM19006	Replace watch batteries	1	*
MEM19007	Perform gemstone setting	6	*
MEM19009	Perform investment procedures for lost wax casting process	1	*
MEM19010	Produce rubber moulds for lost wax casting process	2	*
MEM19011	Perform wax injection of moulds for lost wax casting process	2	*
MEM19012	Produce jewellery wax model	4	*
MEM19014	Perform hand engraving	4	*
MEM19015	Perform jewellery enamelling	4	*
MEM19016	Construct jewellery components	4	*
MEM19017	Fabricate jewellery items	6	*
MEM19020	Fault find and maintain micro-mechanisms	4	*
MEM19021	Diagnose and service micro-mechanisms	6	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM20001	Produce keys	4	*
MEM20002	Assemble and test lock mechanisms	6	*
MEM20003	Install and upgrade locks and hardware	4	*
MEM20004	Gain entry	4	*
MEM20005	Install and maintain door control devices/systems	2	*
MEM20006	Maintain and service mechanical locking devices	6	*
MEM20007	Plan and prepare a masterkey system	4	*
MEM20009	Gain entry and reinstate fire and security containers	4	*
MEM20010	Gain entry and reinstate automotive locking systems	4	*
MEM20014	Perform a site security survey	2	*
MEM21001	Replace watch batteries, capacitors and bands	2	*
MEM21002	Perform watch movement exchange	2	*
MEM21003	Perform watch case servicing, repair and refurbishment	4	*
MEM21004	Clean watch and clock components	2	*
MEM21005	Diagnose faults in quartz watches	2	*
MEM21006	Service quartz watches	4	*
MEM21007	Service complex quartz watches	4	*
MEM21008	Service mechanical watches	4	*
MEM21009	Inspect, diagnose, adjust and repair mechanical watches	4	*
MEM21010	Service watch power generating systems	2	*
MEM21011	Service calendar and other dial indication mechanisms for watches	4	*
MEM21012	Service and repair mechanical watch oscillating systems	4	*
MEM21013	Service, test and adjust watch escapements	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM21014	Service mechanical chronograph watches	6	*
MEM21015	Perform precision watch timing and adjustment	6	*
MEM21016	Install and set up clocks	2	*
MEM21017	Service and repair clock timepieces	6	*
MEM24001B	Perform basic penetrant testing	2	*
MEM24003B	Perform basic magnetic particle testing	2	*
MEM24005B	Perform basic eddy current testing	2	*
MEM24007B	Perform ultrasonic thickness testing	2	*
MEM24009B	Perform basic radiographic testing	2	*
MEM25001	Apply fibre-reinforced materials	2	*
MEM25002	Form and integrate fibre-reinforced structures	4	*
MEM25003	Set up marine vessel structures	4	*
MEM25004	Fair and shape surfaces	2	*
MEM25005	Construct and assemble marine vessel timber components	8	*
MEM25006	Undertake marine sheathing operations	2	*
MEM25007	Maintain marine vessel surfaces	4	*
MEM25009	Form timber shapes using hot processes	2	*
MEM25010	Perform fitout procedures	4	*
MEM25011	Install marine systems	8	*
MEM25012	Install and test operations of marine auxiliary systems	6	*
MEM25014	Perform marine slipping operations	2	*
MEM25015	Assemble and install equipment and accessories/ancillaries	2	*
MEM27001	Maintain and repair stationary and mobile plant engine cooling systems	2	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM27002	Test and repair compression ignition systems	4	*
MEM27003	Overhaul engine fuel system components	4	*
MEM27004	Maintain and repair engine lubrication systems	2	*
MEM27005	Tune diesel engines	4	*
MEM27006	Diagnose and rectify batteries, low voltage sensors and circuits	8	*
MEM27007	Diagnose and rectify low voltage starting systems	2	*
MEM27008	Maintain induction, exhaust and emission control systems	4	*
MEM27009	Diagnose and rectify braking systems	6	*
MEM27010	Diagnose and rectify low voltage charging systems	2	*
MEM27011	Maintain track type undercarriage on mobile plant	4	*
MEM27012	Maintain mobile plant suspension systems	4	*
MEM27013	Maintain steering systems	4	*
MEM27014	Diagnose and rectify automatic transmissions	8	*
MEM27015	Diagnose and rectify drive line and final drives	4	*
MEM27016	Diagnose and maintain electronic controlling systems on mobile and stationary plant	4	*
MEM27017	Maintain, fault find and rectify hydraulic systems for mobile plant	4	*
MEM27019	Diagnose, repair and replace diesel engines in stationary and mobile plant	5	*
MEM27020	Apply knowledge of large combustion engine operations to service and maintenance tasks	2	*
MEM27021	Maintain, fault find and repair stationary plant gas turbine engines	6	*
MEM27022	Maintain, fault find and repair traction drive mechanics	4	*
MEM27023	Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment	4	*

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>	<b>Pre req</b>
MEM27026	Service and repair mobile plant air conditioning systems	4	*
MEM27029	Maintain wheels and tyres	2	*
MEM27030	Perform engine bottom-end overhaul	4	*
MEM27031	Perform engine top-end overhaul	8	*
MEM27032	Service combustion engines	2	*
MEM50002	Work safely on marine craft	1	*
MEM50003	Follow work procedures to maintain the marine environment	1	*
MEM50004	Maintain quality of environment by following marina codes	1	*
MEM50009	Safely operate a mechanically powered recreational boat	2	*
MSMENV472	Implement and monitor environmentally sustainable work practices	4	
CPPFES2027A	Inspect, test and maintain non-gaseous pre-engineered fire-suppression systems	2	
CPPFES3042A	Install and commission pre-engineered fire-suppression systems	2	
CPPSEC2021A	Install security equipment and system	4	
CPPSEC3036A	Program security equipment and system	2	
CPPSEC3037A	Test installed security equipment and system	2	
CPPSEC3038A	Commission and decommission security equipment and system	2	
CPPSEC3039A	Identify and diagnose electronic security equipment and system fault	2	
CPPSEC3041A	Maintain and service security equipment and system	4	
CPPSEC3047A	Provide estimate and quote	4	
CPPSEC3049A	Modify and repair security equipment and system	4	
PMBPROD291	Operate resin infusion moulding equipment	2	
PMBPROD294	Operate resin transfer moulding equipment	2	
PMBPROD298	Operate equipment using pre-preg material	2	

Unit code	Unit title	P	Pre req
PMBPROD391	Produce composites using resin infusion	4	*
PMBPROD394	Produce composites using resin transfer moulding	4	*
PMBPROD398	Produce composites using pre-pregs	4	*
TLILIC0002	Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	1	
TLILIC0003	Licence to operate a forklift truck	0	

## Qualification Mapping Information

Release 1. Supersedes and is equivalent to MEM40105 Certificate IV in Engineering

## Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>