**Victorian Purchasing Guide**

**for**

**MEM Manufacturing and Engineering
Training Package**

**Release 2**

**August 2019**

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Victorian Purchasing Guide ⎯ Release History

**Note**: RTOs should refer to the [National Register](https://training.gov.au/Home/Tga) for the detail of changes made in each Release.

| Training Package Release  | **Date VPGApproved** | Comments |
| --- | --- | --- |
| MEM – Manufacturing and Engineering Training Package Release 2 | 13 August 2019 | Summary of Release 2.0 changes:* 4 new qualifications
* 13 transitioned/reviewed qualifications
* 1 updated qualification - MEM31219
* replacement out-of-date imported units in MEM31219 Certificate in III in Engineering - Industrial Electrician
* 19 new units of competence
* 446 transitioned units of competence
 |
| MEM – Manufacturing and Engineering Training Package Release 1 | 22 June 2015 | Initial Release of the MEM Manufacturing and Engineering Training Package |

**MEM Manufacturing and Engineering Training Package**

**Release 3
Victorian Purchasing Guide**

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INTRODUCTION

What is a Victorian Purchasing Guide?

The Victorian Purchasing Guide provides information for use by Registered Training Organisations (RTOs) in the provision of Victorian government subsidised training.

Specifically the Victorian Purchasing Guide provides the following information related to the delivery of nationally endorsed Training Packages in Victoria:

* The maximum and minimum payable hours available for each qualification.
* Nominal hours for each unit of competency within the Training Package.

Registration

RTOs must be registered by either the Victorian Registration and Qualifications Authority (VRQA) or the Australian Skills Qualification Authority (ASQA) regulatory body to be eligible to issue qualifications and Statements of Attainment under the Australian Qualifications Framework (AQF).

The VRQA is the regulatory authority in Victoria responsible for the registration of Vocational Education and Training (VET) providers who offer courses to domestic students in Victoria only.

ASQA is the regulatory authority responsible for the registration of VET providers who offer training in Victoria, nationally and / or internationally.

Transition

The relationship between new units and any superseded or replaced units from the previous version of **MEM Manufacturing and Engineering Training Package Release 2** is provided in theTraining PackageCompanionVolume Implementation Guide, available [here](https://vetnet.education.gov.au/Pages/default.aspx).

Information regarding transition arrangements can be obtained from the state or national VET Regulatory Authority (see Contacts and Links section).

RTOs must ensure that all training and assessment leading to issuance of qualifications or Statements of Attainment from the **MEM Manufacturing and Engineering Training Package Release 2** is conducted against the Training Package units of competency and complies with the assessment requirements.

QUALIFICATIONS

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Title** | **Minimum Payable Hours** | **Maximum Payable Hours** |
| MEM10119 | Certificate I in Engineering | 190 | 200 |
| MEM20219 | Certificate II in Engineering – Production Technology | 665 | 700 |
| MEM30119 | Certificate III in Engineering – Production Systems | 960 | 1000 |
| MEM30219 | Certificate III in Engineering – Mechanical Trade | 960 | 1000 |
| MEM30319 | Certificate III in Engineering – Fabrication Trade | 960 | 1000 |
| MEM30619 | Certificate III in Jewellery Manufacture | 960 | 1000 |
| MEM30719 | Certificate III in Marine Craft Construction | 960 | 1000 |
| MEM30819 | Certificate III in Locksmithing | 960 | 1000 |
| MEM30919 | Certificate III in Boating Services | 610 | 640 |
| MEM31019 | Certificate III in Watch and Clock Service and Repair | 960 | 1000 |
| MEM31119 | Certificate III in Engineering - Composites Trade | 960 | 1000 |
| MEM31219 | Certificate III in Engineering - Industrial Electrician | 1055 | 1100 |
| MEM31319 | Certificate III in Refrigeration and Air Conditioning | 960 | 1000 |
| MEM31419 | Certificate III in Engineering – Fixed and Mobile Plant Mechanic | 960 | 1000 |
| MEM31519 | Certificate III in Engineering – Toolmaking Trade | 1065 | 1120 |
| MEM31719 | Certificate III in Engineering – Casting and Moulding Trade | 960 | 1000 |
| MEM40119 | Certificate IV in Engineering | 1290 | 1360 |
| MEM50119 | Diploma of Engineering – Advanced Trade | 1540 | 1620 |

UNITS OF COMPETENCY AND NOMINAL HOURS

| Unit Code | Unit Title | Nominal Hours |
| --- | --- | --- |
| MEM03001 | Perform manual production assembly | 40 |
| MEM03002 | Perform precision assembly | 40 |
| MEM03003 | Perform sheet and plate assembly | 40 |
| MEM03004 | Perform electronic/electrical assembly (production) | 80 |
| MEM03005 | Rework and repair (electrical/electronic production) | 80 |
| MEM03006 | Set assembly stations | 20 |
| MEM04001 | Operate melting furnaces | 40 |
| MEM04002 | Perform gravity die casting | 20 |
| MEM04003 | Operate pressure die casting machine | 20 |
| MEM04004 | Prepare and mix sand for metal moulding | 40 |
| MEM04006 | Operate sand moulding and core making machines | 80 |
| MEM04007 | Pour molten metal | 40 |
| MEM04008 | Fettle and trim metal castings/forgings | 40 |
| MEM04010 | Develop and manufacture wood patterns | 200 |
| MEM04011 | Produce polymer patterns | 80 |
| MEM04012 | Assemble plated patterns | 80 |
| MEM04013 | Develop and manufacture polystyrene patterns | 20 |
| MEM04014 | Develop and manufacture production patterns | 80 |
| MEM04015 | Develop and manufacture vacuum forming moulds and associated equipment | 60 |
| MEM04016 | Develop and manufacture precision models | 60 |
| MEM04017 | Develop and manufacture gear, conveyor screw and propeller patterns | 40 |
| MEM04018 | Perform general woodworking machine operations | 40 |
| MEM04019 | Perform refractory installation and repair | 40 |
| MEM04020 | Supervise individual ferrous melting and casting operation | 40 |
| MEM04021 | Supervise individual non-ferrous melting and casting operation | 40 |
| MEM04022 | Examine appropriateness of methoding for mould design | 40 |
| MEM04023 | Undertake prescribed tests on foundry-related materials | 40 |
| MEM04024 | Produce moulds and cores by hand | 40 |
| MEM04025 | Produce moulds and cores by hand (advanced) | 120 |
| MEM05001 | Perform manual soldering/desoldering - electrical/electronic components | 40 |
| MEM05002 | Perform high reliability soldering and desoldering | 40 |
| MEM05003 | Perform soft soldering | 20 |
| MEM05004 | Perform routine oxy fuel gas welding | 20 |
| MEM05005 | Carry out mechanical cutting | 20 |
| MEM05006 | Perform brazing and/or silver soldering | 20 |
| MEM05007 | Perform manual heating and thermal cutting | 20 |
| MEM05008 | Perform advanced manual thermal cutting, gouging and shaping | 20 |
| MEM05009 | Perform automated thermal cutting | 20 |
| MEM05010 | Apply fabrication, forming and shaping techniques | 80 |
| MEM05011 | Assemble fabricated components | 80 |
| MEM05012 | Perform routine manual metal arc welding | 20 |
| MEM05013 | Perform manual production welding | 20 |
| MEM05014 | Monitor quality of production welding/fabrications | 20 |
| MEM05015 | Weld using manual metal arc welding process | 40 |
| MEM05016 | Perform advanced welding using manual metal arc welding process | 40 |
| MEM05017 | Weld using gas metal arc welding process | 40 |
| MEM05018 | Perform advanced welding using gas metal arc welding process | 40 |
| MEM05019 | Weld using gas tungsten arc welding process | 40 |
| MEM05020 | Perform advanced welding using gas tungsten arc welding process | 40 |
| MEM05022 | Perform advanced welding using oxy acetylene welding process | 60 |
| MEM05023 | Weld using submerged arc welding process | 40 |
| MEM05024 | Perform welding supervision | 120 |
| MEM05025 | Perform welding/fabrication inspection | 120 |
| MEM05026 | Apply welding principles | 40 |
| MEM05027 | Perform aluminothermic welding | 20 |
| MEM05036 | Repair, replace and/or modify fabrications | 40 |
| MEM05037 | Perform geometric development | 60 |
| MEM05038 | Perform advanced geometric development - cylindrical/rectangular | 20 |
| MEM05039 | Perform advanced geometric development - conical | 20 |
| MEM05040 | Perform advanced geometric development - transitions | 40 |
| MEM05041 | Weld using flame powder spraying | 40 |
| MEM05042 | Perform welds to code standards using flux core arc welding process | 60 |
| MEM05043 | Perform welds to code standards using gas metal arc welding process | 60 |
| MEM05044 | Perform welds to code standards using gas tungsten arc welding process | 60 |
| MEM05045 | Perform pipe welds to code standards using manual metal arc welding process | 60 |
| MEM05046 | Perform welds to code standards using manual metal arc welding process | 60 |
| MEM05047 | Weld using flux core arc welding process | 40 |
| MEM05048 | Perform advanced welding using flux core arc welding process | 40 |
| MEM05049 | Perform routine gas tungsten arc welding | 20 |
| MEM05050 | Perform routine gas metal arc welding | 20 |
| MEM05051 | Select welding processes | 20 |
| MEM05052 | Apply safe welding practices | 40 |
| MEM05053 | Set and edit computer controlled thermal cutting machines | 40 |
| MEM05054 | Write basic NC/CNC programs for thermal cutting machines | 40 |
| MEM05055 | Weld using oxy fuel gas welding process | 40 |
| MEM05056 | Perform routine flux core arc welding | 20 |
| MEM05057 | Perform routine submerged arc welding | 20 |
| MEM05058 | Perform welds to code standards using oxy fuel gas welding process | 60 |
| MEM06001 | Perform hand forging | 40 |
| MEM06002 | Perform hammer forging | 40 |
| MEM06003 | Carry out heat treatment | 60 |
| MEM06004 | Select heat treatment processes and test finished product | 60 |
| MEM06005 | Perform drop and upset forging | 40 |
| MEM06006 | Repair springs | 40 |
| MEM06007 | Perform basic incidental heat/quenching, tempering and annealing | 20 |
| MEM06008 | Hammer forge complex shapes | 40 |
| MEM06009 | Hand forge complex shapes | 40 |
| MEM07001 | Perform operational maintenance of machines/equipment | 20 |
| MEM07002 | Perform precision shaping/planing/slotting operations | 40 |
| MEM07003 | Perform routine machine setting  | 40 |
| MEM07004 | Perform complex machine setting | 80 |
| MEM07005 | Perform general machining | 80 |
| MEM07006 | Perform lathe operations | 40 |
| MEM07007 | Perform milling operations | 40 |
| MEM07008 | Perform grinding operations | 40 |
| MEM07009 | Perform precision jig boring operations | 40 |
| MEM07010 | Perform tool and cutter grinding operations | 40 |
| MEM07011 | Perform complex milling operations | 40 |
| MEM07012 | Perform complex grinding operations | 40 |
| MEM07013 | Perform machining operations using horizontal and vertical boring machines | 40 |
| MEM07014 | Perform electro-discharge machining (EDM) operations | 40 |
| MEM07015 | Set computer controlled machines and processes | 20 |
| MEM07016 | Set and edit computer controlled machines and processes | 40 |
| MEM07018 | Write basic NC and CNC programs | 40 |
| MEM07019 | Program NC and CNC machining centre | 20 |
| MEM07020 | Program multiple spindle and multiple axis NC and CNC machining centre | 20 |
| MEM07021 | Perform complex lathe operations | 40 |
| MEM07022 | Program CNC wire cut machines | 20 |
| MEM07023 | Program and set up CNC manufacturing cell | 60 |
| MEM07024 | Operate and monitor machine and process | 40 |
| MEM07025 | Perform advanced machine and process operation | 60 |
| MEM07026 | Perform advanced plastic processing | 60 |
| MEM07027 | Perform advanced press operations | 60 |
| MEM07028 | Operate computer controlled machines and processes | 20 |
| MEM07029 | Perform routine sharpening and maintenance of production tools and cutters | 40 |
| MEM07030 | Perform basic metal spinning lathe operations | 80 |
| MEM07031 | Perform complex metal spinning lathe operations | 40 |
| MEM07032 | Use workshop machines for basic operations | 20 |
| MEM07033 | Operate and monitor basic boiler | 60 |
| MEM07039 | Write programs for industrial robots | 40 |
| MEM07040 | Set multistage integrated processes | 40 |
| MEM07041 | Perform production machining | 80 |
| MEM07042 | Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems | 40 |
| MEM07043 | Identify causes of faulty aluminium extrusions | 60 |
| MEM07044 | Test a new aluminium extrusion die | 40 |
| MEM08001 | Perform wire, jig and barrel load/unload work | 40 |
| MEM08002 | Pre-treat work for subsequent surface coating | 40 |
| MEM08003 | Perform electroplating operations | 60 |
| MEM08004 | Finish work using wet, dry and vapour deposition methods | 40 |
| MEM08005 | Prepare and produce specialised coatings | 40 |
| MEM08006 | Produce clear and/or coloured and/or sealed anodised films on aluminium | 20 |
| MEM08007 | Control surface finish production and finished product quality | 40 |
| MEM08008 | Operate and control surface finishing waste treatment process | 30 |
| MEM08009 | Make up solutions | 20 |
| MEM08010 | Manually finish/polish materials | 60 |
| MEM08011 | Prepare surfaces using solvents and/or mechanical means | 20 |
| MEM08012 | Prepare surfaces by abrasive blasting (basic) | 40 |
| MEM08013 | Prepare surfaces by abrasive blasting (advanced) | 40 |
| MEM08014 | Apply protective coatings (basic) | 40 |
| MEM08015 | Apply protective coatings (advanced) | 40 |
| MEM08016 | Control blast coating by-products, materials and emissions | 10 |
| MEM08018 | Electroplate engineering coatings | 60 |
| MEM08019 | Electroplate protective finishes | 60 |
| MEM08020 | Electroplate decorative finishes | 60 |
| MEM09002 | Interpret technical drawing | 40 |
| MEM09003 | Prepare basic engineering drawing | 80 |
| MEM09004 | Perform electrical or electronic detail drafting | 80 |
| MEM09005 | Perform basic engineering detail drafting | 80 |
| MEM09006 | Perform advanced engineering detail drafting | 40 |
| MEM09007 | Perform advanced mechanical detail drafting | 40 |
| MEM09008 | Perform advanced structural detail drafting | 40 |
| MEM09009 | Create 2-D drawings using computer-aided design system | 80 |
| MEM09010 | Create 3-D models using computer-aided design system | 40 |
| MEM09011 | Apply basic engineering design concepts | 60 |
| MEM09021 | Interpret and produce drawings of curved 3-D shapes | 40 |
| MEM09022 | Create 2-D code files using computer-aided manufacturing system | 40 |
| MEM09023 | Create 3-D code files using computer-aided manufacturing system | 60 |
| MEM10001 | Erect structures | 40 |
| MEM10002 | Terminate and connect electrical wiring | 30 |
| MEM10003 | Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c. | 120 |
| MEM10004 | Enter and change programmable controller operational parameters | 20 |
| MEM10005 | Commission programmable controller programs | 40 |
| MEM10006 | Install machine/plant | 40 |
| MEM10007 | Modify control systems | 60 |
| MEM10008 | Undertake commissioning procedures for plant and/or equipment | 40 |
| MEM10009 | Install refrigeration and air conditioning plant and equipment | 40 |
| MEM10010 | Install pipework and pipework assemblies | 40 |
| MEM10011 | Terminate and connect specialist cables | 30 |
| MEM10013 | Install split air conditioning systems and associated pipework | 60 |
| MEM10016 | Terminate and test electrical wiring and accessories | 40 |
| MEM10018 | Select cable types and sizes to suit loads and electrical installation environment | 40 |
| MEM10019 | Select circuit protection devices by type and rating, fit to switchboards and install earthing | 40 |
| MEM10020 | Install low voltage cabling and fit-off accessories, appliances and equipment | 40 |
| MEM10021 | Inspect, test and verify electrical installations | 40 |
| MEM10022 | Commission and decommission high and low voltage equipment or installations | 40 |
| MEM10023 | Design and connect control switching of circuits for building services and industrial equipment | 40 |
| MEM10024 | Install and troubleshoot luminaires and ancillary equipment | 40 |
| MEM10025 | Undertake a capstone assessment | 10 |
| MEM11001 | Erect/dismantle scaffolding and equipment | 40 |
| MEM11002 | Erect/dismantle intermediate scaffolding and equipment | 40 |
| MEM11003 | Coordinate erection/dismantling of complex scaffolding/equipment | 40 |
| MEM11004 | Undertake dogging | 40 |
| MEM11005 | Pick and process order | 40 |
| MEM11006 | Perform production packaging | 20 |
| MEM11007 | Administer inventory procedures | 40 |
| MEM11008 | Package materials (stores and warehouse) | 20 |
| MEM11009 | Handle/move bulk fluids/gases | 40 |
| MEM11010 | Operate mobile load shifting equipment | 40 |
| MEM11011 | Undertake manual handling | 20 |
| MEM11012 | Purchase materials | 60 |
| MEM11013 | Undertake warehouse receival process | 40 |
| MEM11014 | Undertake warehouse dispatch process | 40 |
| MEM11015 | Manage warehouse inventory system | 40 |
| MEM11016 | Order materials | 20 |
| MEM11017 | Organise and lead stocktakes | 40 |
| MEM11018 | Organise and maintain warehouse stock receival and dispatch system | 60 |
| MEM11019 | Undertake tool store procedures | 40 |
| MEM11020 | Perform advanced warehouse computer operations | 40 |
| MEM11021 | Perform advanced operation of load shifting equipment | 20 |
| MEM11022 | Operate fixed/moveable load shifting equipment | 40 |
| MEM11023 | Operate a bridge and gantry crane  | 10 |
| MEM11024 | Undertake basic rigging  | 10 |
| MEM11025 | Operate a non-slewing mobile crane of greater than three tonnes capacity  | 10 |
| MEM12001 | Use comparison and basic measuring devices | 20 |
| MEM12002 | Perform electrical/electronic measurement | 20 |
| MEM12003 | Perform precision mechanical measurement | 20 |
| MEM12004 | Perform precision electrical/electronic measurement | 40 |
| MEM12005 | Calibrate measuring equipment | 60 |
| MEM12006 | Mark off/out (general engineering) | 40 |
| MEM12007 | Mark off/out structural fabrications and shapes | 40 |
| MEM12019 | Measure components using coordinate measuring machines | 40 |
| MEM12020 | Set and operate coordinate measuring machines | 20 |
| MEM12021 | Program coordinate measuring machines | 40 |
| MEM12022 | Program coordinate measuring machines (advanced) | 20 |
| MEM12023 | Perform engineering measurements | 30 |
| MEM12024 | Perform computations | 30 |
| MEM12025 | Use graphical techniques and perform simple statistical computations | 20 |
| MEM12026 | Perform advanced trade calculations in a manufacturing, engineering or related environment | 40 |
| MEM13001 | Perform emergency first aid | 10 |
| MEM13002 | Undertake work health and safety activities in the workplace | 30 |
| MEM13003 | Work safely with industrial chemicals and materials | 20 |
| MEM13004 | Work safely with molten metals/glass | 20 |
| MEM13006 | Collect and evaluate work health and safety data for an enterprise or section of an enterprise | 40 |
| MEM13007 | Maintain water treatment systems for cooling towers | 20 |
| MEM13010 | Supervise work health and safety in an industrial work environment | 40 |
| MEM13013 | Work safely with ionizing radiation | 40 |
| MEM13015 | Work safely and effectively in manufacturing and engineering | 40 |
| MEM13016 | Work in hazardous areas | 20 |
| MEM13017 | Apply safety practices, procedures and compliance standards associated with licensed electrical work | 20 |
| MEM14001 | Schedule material deliveries | 80 |
| MEM14002 | Undertake basic process planning | 80 |
| MEM14003 | Undertake production scheduling | 80 |
| MEM14006 | Plan work activities | 40 |
| MEM15001 | Perform basic statistical quality control | 20 |
| MEM15003 | Use improvement processes in team activities | 40 |
| MEM15004 | Perform inspection | 20 |
| MEM15005 | Select and control inspection processes and procedures | 40 |
| MEM15007 | Conduct product and/or process capability studies | 60 |
| MEM15008 | Perform advanced statistical quality control | 20 |
| MEM15010 | Perform laboratory procedures | 80 |
| MEM15011 | Exercise external quality assurance | 60 |
| MEM15012 | Maintain/supervise the application of quality procedures | 40 |
| MEM16001 | Give formal presentations and take part in meetings | 20 |
| MEM16002 | Conduct formal interviews and negotiations | 40 |
| MEM16003 | Provide advanced customer service | 20 |
| MEM16004 | Perform internal/external customer service | 20 |
| MEM16005 | Operate as a team member to conduct manufacturing, engineering or related activities | 20 |
| MEM16006 | Organise and communicate information | 20 |
| MEM16008 | Interact with computing technology | 20 |
| MEM16009 | Research and analyse engineering information | 20 |
| MEM16010 | Write reports | 20 |
| MEM16011 | Communicate with individuals and small groups | 20 |
| MEM16012 | Interpret technical specifications and manuals | 40 |
| MEM16013 | Operate in a self-directed team | 20 |
| MEM16014 | Report technical information | 20 |
| MEM17001 | Assist in development and deliver training in the workplace | 20 |
| MEM17002 | Conduct workplace assessment | 20 |
| MEM17003 | Assist in the provision of on-the-job training | 20 |
| MEM18001 | Use hand tools | 20 |
| MEM18002 | Use power tools/hand held operations | 20 |
| MEM18003 | Use tools for precision work | 40 |
| MEM18004 | Maintain and overhaul mechanical equipment | 40 |
| MEM18005 | Perform fault diagnosis, installation and removal of bearings | 40 |
| MEM18006 | Perform precision fitting of engineering components | 60 |
| MEM18007 | Maintain and repair mechanical drives and mechanical transmission assemblies | 40 |
| MEM18008 | Balance equipment | 20 |
| MEM18009 | Perform precision levelling and alignment of machines and engineering components | 40 |
| MEM18010 | Perform equipment condition monitoring and recording | 40 |
| MEM18011 | Shut down and isolate machines/equipment | 20 |
| MEM18012 | Perform installation and removal of mechanical seals | 20 |
| MEM18013 | Perform gland packing | 20 |
| MEM18014 | Manufacture press tools and gauges | 80 |
| MEM18015 | Maintain tools and dies | 40 |
| MEM18016 | Analyse plant and equipment condition monitoring results | 40 |
| MEM18017 | Modify mechanical systems and equipment | 80 |
| MEM18018 | Maintain pneumatic system components | 40 |
| MEM18019 | Maintain pneumatic systems | 40 |
| MEM18020 | Maintain hydraulic system components | 40 |
| MEM18021 | Maintain hydraulic systems | 40 |
| MEM18022 | Maintain fluid power controls | 80 |
| MEM18023 | Modify fluid power system operation | 80 |
| MEM18045 | Fault find and repair electrical equipment/components up to 250 volts single phase supply | 40 |
| MEM18046 | Fault find and repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c. | 100 |
| MEM18048 | Fault find and repair/rectify basic electrical circuits | 120 |
| MEM18049 | Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c. | 30 |
| MEM18050 | Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c. | 30 |
| MEM18051 | Fault find and repair/rectify complex electrical circuits | 60 |
| MEM18053 | Modify fluid power control systems | 60 |
| MEM18054 | Fault find, test and calibrate instrumentation systems and equipment | 80 |
| MEM18055 | Dismantle, replace and assemble engineering components | 30 |
| MEM18056 | Diagnose and repair analog equipment and components | 100 |
| MEM18057 | Maintain/service analog/digital electronic equipment | 60 |
| MEM18058 | Modify electronic equipment | 40 |
| MEM18059 | Modify electronic systems | 40 |
| MEM18060 | Maintain, repair control instrumentation - single and multiple loop control systems | 80 |
| MEM18061 | Maintain/calibrate complex control systems | 80 |
| MEM18062 | Install, maintain and calibrate instrumentation sensors, transmitters and final control elements | 80 |
| MEM18063 | Terminate signal and data cables | 40 |
| MEM18064 | Maintain instrumentation system components | 60 |
| MEM18065 | Diagnose and repair digital equipment and components | 100 |
| MEM18066 | Diagnose and repair microprocessor-based equipment | 60 |
| MEM18067 | Tune control loops - multi controller or multi element systems | 60 |
| MEM18069 | Maintain, repair instrumentation process control analysers | 60 |
| MEM18071 | Connect and disconnect fluid conveying system components | 20 |
| MEM18072 | Manufacture fluid conveying conductor assemblies | 40 |
| MEM18083 | Handle fluorocarbon refrigerants according to regulations | 20 |
| MEM18084 | Commission and decommission split air conditioning systems | 40 |
| MEM18085 | Install, service and repair domestic air conditioning and refrigeration appliances  | 60 |
| MEM18086 | Test, recover, evacuate and charge refrigeration systems | 40 |
| MEM18087 | Service and repair domestic and light commercial refrigeration and air conditioning equipment | 60 |
| MEM18088 | Maintain and repair commercial air conditioning systems and components | 40 |
| MEM18089 | Maintain and repair central air handling systems | 60 |
| MEM18090 | Maintain and repair industrial refrigeration systems and components | 60 |
| MEM18091 | Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems | 40 |
| MEM18092 | Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls | 60 |
| MEM18093 | Maintain and repair integrated industrial refrigeration and/or large air handling system controls | 80 |
| MEM18094 | Service and repair commercial refrigeration | 60 |
| MEM18095 | Maintain and repair cooling towers/evaporative condensers and associated equipment | 40 |
| MEM18096 | Maintain, repair/replace and adjust refrigerant flow controls and associated equipment | 60 |
| MEM18097 | Manufacture cavity dies | 80 |
| MEM18098 | Prepare to perform work associated with fuel system installation and servicing  | 20 |
| MEM18100 | Fault-find, test and rectify AC machines and circuits | 40 |
| MEM18102 | Fault-find, test and rectify single and three-phase transformers | 40 |
| MEM18103 | Fault-find, test and rectify electrical circuits and equipment | 40 |
| MEM18104 | Dismantle, replace and assemble electrical components and equipment | 40 |
| MEM18105 | Disconnect and reconnect high voltage fixed wired equipment | 40 |
| MEM18106 | Terminate communication and data cables  | 40 |
| MEM18108 | Troubleshoot analog and digital electronic equipment | 40 |
| MEM18109 | Troubleshoot instrumentation systems and equipment | 40 |
| MEM19001 | Perform jewellery metal casting | 60 |
| MEM19002 | Prepare jewellery illustrations | 40 |
| MEM19003 | Handle gem materials | 20 |
| MEM19004 | Handle and examine gemstone materials | 60 |
| MEM19005 | Produce three-dimensional precision items | 80 |
| MEM19006 | Replace watch batteries | 10 |
| MEM19007 | Perform gemstone setting | 60 |
| MEM19008 | Prepare jewellery designs | 60 |
| MEM19009 | Perform investment procedures for lost wax casting process | 10 |
| MEM19010 | Produce rubber moulds for lost wax casting process | 20 |
| MEM19011 | Perform wax injection of moulds for lost wax casting process | 20 |
| MEM19012 | Produce jewellery wax model | 40 |
| MEM19013 | Produce jewellery metal masters | 40 |
| MEM19014 | Perform hand engraving | 40 |
| MEM19015 | Perform jewellery enamelling | 40 |
| MEM19016 | Construct jewellery components | 40 |
| MEM19017 | Fabricate jewellery items | 60 |
| MEM19018 | Repair jewellery items | 60 |
| MEM19020 | Fault find and maintain micro-mechanisms | 40 |
| MEM19021 | Diagnose and service micro-mechanisms | 60 |
| MEM19022 | Perform precision micro-mechanism diagnosis and servicing | 60 |
| MEM20001 | Produce keys | 40 |
| MEM20002 | Assemble and test lock mechanisms | 60 |
| MEM20003 | Install and upgrade locks and hardware | 40 |
| MEM20004 | Gain entry | 40 |
| MEM20005 | Install and maintain door control devices/systems | 20 |
| MEM20006 | Maintain and service mechanical locking devices | 60 |
| MEM20007 | Plan and prepare a masterkey system | 60 |
| MEM20008 | Develop and implement a masterkey system | 40 |
| MEM20009 | Gain entry and reinstate fire and security containers | 40 |
| MEM20010 | Gain entry and reinstate automotive locking systems | 40 |
| MEM20011 | Service and repair fire and security containers | 60 |
| MEM20012 | Service and repair mechanical automotive locking systems | 60 |
| MEM20013 | Service automotive transponder systems | 20 |
| MEM20014 | Perform a site security survey | 20 |
| MEM21001 | Replace watch batteries, capacitors and bands  | 20 |
| MEM21002 | Perform watch movement exchange  | 20 |
| MEM21003 |  Perform watch case servicing, repair and refurbishment  | 40 |
| MEM21004 | Clean watch and clock components  | 20 |
| MEM21005 | Diagnose faults in quartz watches  | 20 |
| MEM21006 | Service quartz watches  | 40 |
| MEM21007 | Service complex quartz watches  | 40 |
| MEM21008 | Service mechanical watches  | 40 |
| MEM21009 | Inspect, diagnose, adjust and repair mechanical watches  | 40 |
| MEM21010 | Service watch power generating systems  | 20 |
| MEM21011 | Service calendar and other dial indication mechanisms for watches  | 40 |
| MEM21012 | Service and repair mechanical watch oscillating systems  | 40 |
| MEM21013 | Service, test and adjust watch escapements  | 40 |
| MEM21014 | Service mechanical chronograph watches  | 60 |
| MEM21015 | Perform precision watch timing and adjustment  | 60 |
| MEM21016 | Install and set up clocks  | 20 |
| MEM21017 | Service and repair clock timepieces  | 60 |
| MEM21018 | Service clock escapements and oscillating systems  | 40 |
| MEM21019 | Service and repair clock striking mechanisms  | 40 |
| MEM21020 | Service and repair clock chiming mechanisms  | 60 |
| MEM21021 | Restore clockwork mechanisms  | 60 |
| MEM21022 | Manufacture watch and clock components  | 60 |
| MEM21023 | Plan, set up and operate horological workshop or service centre  | 40 |
| MEM25001 | Apply fibre-reinforced materials | 20 |
| MEM25002 | Form and integrate fibre-reinforced structures | 40 |
| MEM25003 | Set up marine vessel structures | 40 |
| MEM25004 | Fair and shape surfaces | 20 |
| MEM25005 | Construct and assemble marine vessel timber components | 80 |
| MEM25006 | Undertake marine sheathing operations | 20 |
| MEM25007 | Maintain marine vessel surfaces | 40 |
| MEM25008 | Repair marine vessel surfaces and structures | 40 |
| MEM25009 | Form timber shapes using hot processes | 20 |
| MEM25010 | Perform fitout procedures | 40 |
| MEM25011 | Install marine systems | 80 |
| MEM25012 | Install and test operations of marine auxiliary systems | 60 |
| MEM25013 | Produce three-dimensional plugs/moulds | 120 |
| MEM25014 | Perform marine slipping operations | 20 |
| MEM25015 | Assemble and install equipment and accessories/ancillaries | 20 |
| MEM26001 | Lay up composites using open moulding techniques | 60 |
| MEM26002 | Lay up composites using vacuum closed moulding techniques | 60 |
| MEM26003 | Lay up composites using pressure closed moulding techniques | 80 |
| MEM26004 | Make basic plugs for composites fabrication | 30 |
| MEM26005 | Make basic moulds for composites fabrications | 30 |
| MEM26006 | Mark and cut out sheets for composite use | 40 |
| MEM26007 | Select and use reinforcing appropriate for product | 40 |
| MEM26008 | Select and use resin systems appropriate for product  | 40 |
| MEM26009 | Select and use cores and fillers appropriate for product  | 20 |
| MEM26010 | Store and handle composite materials  | 20 |
| MEM26011 | Determine materials and techniques for a composite component or product | 60 |
| MEM26012 | Record and trial work processes for one-off composite products  | 40 |
| MEM26013 | Select and use composite processes or systems appropriate for product  | 40 |
| MEM26014 | Adjust resin chemicals for current conditions  | 40 |
| MEM26015 | Select and apply repair techniques  | 60 |
| MEM26016 | Select and use joining techniques  | 60 |
| MEM26017 | Prepare composite or other substrate surfaces  | 40 |
| MEM26018 | Organise composite trials  | 40 |
| MEM26019 | Finish a composite product  | 40 |
| MEM26020 | Identify and interpret required standards for composites  | 20 |
| MEM27001 | Maintain and repair stationary and mobile plant engine cooling systems | 40 |
| MEM27002 | Test and repair compression ignition systems | 40 |
| MEM27003 | Overhaul engine fuel system components | 40 |
| MEM27004 | Maintain and repair engine lubrication systems | 20 |
| MEM27005 | Tune diesel engines | 40 |
| MEM27006 | Diagnose and rectify batteries, low voltage sensors and circuits | 40 |
| MEM27007 | Diagnose and rectify low voltage starting systems | 20 |
| MEM27008 | Maintain induction, exhaust and emission control system | 30 |
| MEM27009 | Diagnose and rectify braking system | 40 |
| MEM27010 | Diagnose and rectify low voltage charging systems | 20 |
| MEM27011 | Maintain track type undercarriage on mobile plant | 20 |
| MEM27012 | Maintain mobile plant suspension systems | 40 |
| MEM27013 | Maintain steering systems | 20 |
| MEM27014 | Diagnose and rectify automatic transmission | 20 |
| MEM27015 | Diagnose and rectify drive line and final drives | 40 |
| MEM27016 | Diagnose and maintain electronic controlling systems on mobile and stationary plant | 30 |
| MEM27017 | Maintain, fault find and rectify hydraulic systems for mobile plant | 60 |
| MEM27018 | Test, diagnose and rectify mobile and stationary plant external monitoring and control systems | 40 |
| MEM27019 | Diagnose, repair and replace diesel engines in stationary and mobile plant | 50 |
| MEM27020 | Apply knowledge of large combustion engine operations to service and maintenance tasks | 20 |
| MEM27021 | Maintain, fault find and repair stationary plant gas turbine engine | 60 |
| MEM27022 | Maintain, fault find and repair traction drive mechanics | 40 |
| MEM27023 | Diagnose and rectify fieldbus circuits in mobile and stationary plant and equipment | 40 |
| MEM27024 | Diagnose and rectify mobile plant hydrostatic systems | 40 |
| MEM27025 | Maintain, diagnose and rectify fluid power controls in mobile equipment | 60 |
| MEM27026 | Service and repair mobile plant air conditioning systems | 40 |
| MEM27027 | Install or modify mobile plant air conditioning systems | 40 |
| MEM27028 | Diagnose and rectify manual transmissions | 60 |
| MEM27029 | Maintain wheels and tyres | 40 |
| MEM27030 | Perform engine bottom-end overhaul | 40 |
| MEM27031 | Perform engine top-end overhaul | 80 |
| MEM27032 | Service combustion engines | 20 |
| MEM27033 | Perform advanced equipment testing and diagnostics on mobile plant and equipment | 80 |
| MEM50001 | Classify recreational boating technologies and features | 20 |
| MEM50002 | Work safely on marine craft | 10 |
| MEM50003 | Follow work procedures to maintain the marine environment | 10 |
| MEM50004 | Maintain quality of environment by following marina codes | 10 |
| MEM50005 | Refuel vessels | 40 |
| MEM50006 | Check operational capability of marine craft | 40 |
| MEM50007 | Check operational capability of sails and sail operating equipment | 20 |
| MEM50008 | Carry out trip preparation and planning | 40 |
| MEM50009 | Safely operate a mechanically powered recreational boat | 20 |
| MEM50010 | Respond to boating emergencies and incidents | 40 |

CONTACTS AND LINKS

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| **Curriculum Maintenance Manager (CMM)** |
| EngineeringIndustries | The CMM Service is provided on behalf of Higher Education and Skills.CMM Service Executive Officers can assist with questions on payable and nominal hours. | George AddaBox Hill Institute of TAFE,Private Bag 2014, Box Hill,Victoria, 3128Phone: (03) 9286 9880Fax: (03) 9286 9800Email: g.adda@bhtafe.edu.au |
| **Service Skills Organisation (SSO)** |
| Innovation &Business SkillsAustralia (IBSA) | This SSO is responsible for developing this **MEM Manufacturing and Engineering Training Package** and can be contacted for further information.  | Address:Level 11, 176 Wellington Parade,East Melbourne, VIC 3002.Phone: 03 9815 7099Email: manufacturing@ibsa.org.auThe IBSA website can be found [here](https://www.ibsa.org.au/manufacturing-sso/). |
| **National Register for VET in Australia** |
| Training.gov.au (TGA) | TGA is the Australian government’s official National Register of information on Training Packages, qualifications, courses, units of competency and RTOs. | National Register website can be found [here](https://training.gov.au/home/TGA). |
| **Australian Government** |
| Department of Employment, Skills, Small and Family Business  | The Commonwealth Department is responsible for national policies and programmes that help Australians access quality vocational education and training.  | The Commonwealth Department of Employment, Skills, Small and Family Business website can be found [here](https://www.jobs.gov.au/) |
| **State Government** |
| Department of Education and Training (DET)  | DET is the State Training Authority responsible for supporting implementation of Vocational Education and Training (VET) in Victoria.  | (03) 9637 2000The Victorian Department of Education and Training website can be found [here](http://www.education.vic.gov.au/) |
| **National VET Regulatory Authority** |
| Australian Skills Quality Authority (ASQA) | ASQA is the national regulator for Australia’s VET sector.  | Info line: 1300 701 801 ASQA’s website can be found [here](https://www.asqa.gov.au/) |
| **Victorian VET Regulatory Authority** |
| Victorian Registration and Qualifications Authority (VRQA) | The VRQA is a statutory authority responsible for the registration and regulation of Victorian RTOs and for the regulation of apprenticeships and traineeships in Victoria. | (03) 9637 2806 VRQA’s website can be found [here](https://www.vrqa.vic.gov.au/Pages/default.aspx) |
| **Industry Regulatory Bodies** |
| Energy Safe Victoria | The industry Regulatory body can provide advice on licensing, legislative or regulatory requirements which may impact on the delivery of training or the issuance of qualifications in this Training Package. | Phone: (03) 9203 9700Fax: (03) 9686 2197Email: info@esv.vic.gov.auESV website ca be found [here](https://www.esv.vic.gov.au/) |
| WorkSafe Victoria | WorkSafe needs to provide written verification before High Risk Work Units can be added to an RTO’s scope of registration. | Info line: 1800 136 089WorkSafe Victoria website can be found [here](https://www.worksafe.vic.gov.au/) |

GLOSSARY

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| **Code** | Nationally endorsed Training Package qualification code. |
| **Title** | Nationally endorsed Training Package qualification title. |
| **Unit Code** | Nationally endorsed Training Package unit code. |
| **Unit Title** | Nationally endorsed Training Package unit title. |
| **Maximum Payable Hours** | The maximum number of hours the Victorian Government will subsidise under Skills First funding for the achievement of the minimum realistic vocational outcome of the qualification, as determined by the qualification packaging rules.  The Maximum Payable Hours do not cover every possible combination of core and elective units available for a specific qualification.   Minimum payable hours reflect a calculated minimum number of hours that could deliver a minimum realistic vocational outcome, based on efficiencies of contextualisation and integration. |
| **Scope of Registration** | Scope of registration specifies the AQF qualifications and/or units of competency the training organisation is registered to issue and the industry training and/or assessment services it is registered to provide. |
| **Nominal Hours** | Nominal hours reflect the anticipated time taken to deliver and assess the outcomes of a unit of competency excluding unsupervised delivery or the time taken for repeated practical application of skills. Nominal hours are determined by the Victorian State Training Authority (DET) and are primarily developed for funding purposes in Victoria. |