VICTORIAN PURCHASING GUIDE

MEM MANUFACTURING AND ENGINEERING
TRAINING PACKAGE RELEASE 4.1

AUGUST 2023

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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 in each Release.

| Training Package Release | Date VPG Approved | Comments |
| --- | --- | --- |
| Release 4.1 | 18 August 2023 | This VPG reflects an approved change to the Maximum Payable Hours for the MEM31922 Certificate III in Engineering - Fabrication Trade |
| Release 4.0 | 21 April 2023 | Summary of Release 4.0 changes:• 6 new qualifications• 28 new Units of Competency (UoCs). |
| Release 3.0 | 20 February 2023 | Summary of Release 3.0 changes:• 1 new qualification• 16 revised qualifications with a code change including one qualification previously in the LMT training package• 27 new Units of Competency (UoCs)• 323 revised UoCs with a code change including 222 UoCs from MEM05 Metal and Engineering Training Package and 35 UoCs previously in the MSA07 Manufacturing Training Package |
| Release 2.0 | 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4 new qualifications• 13 transitioned/reviewed qualifications• 1 updated qualification - MEM31219• replacement out-of-date imported units in MEM31219 Certificate in III in Engineering - Industrial Electrician• 19 new units of competence• 446 transitioned units of competence |
| Release 1.0 | 22 June 2015 | Initial Release of the MEM Manufacturing and Engineering Training Package |

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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 4.0 is provided in the Training Package Companion Volume Implementation Guide. (See [VETnet.gov.au](https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875) for more information).

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 4.0 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 |
| MEM10222 | Certificate I in Boating Services | 238 | 250 |
| MEM20219 | Certificate II in Engineering - Production Technology | 665 | 700 |
| MEM20322 | Certificate II in Boating Services | 323 | 340 |
| MEM20422 | Certificate II in Engineering Pathways | 399 | 420 |
| MEM30119 | Certificate III in Engineering - Production Systems | 950 | 1000 |
| MEM30219 | Certificate III in Engineering - Mechanical Trade | 950 | 1000 |
| MEM30422 | Certificate III in Engineering - Electronic Trade | 912 | 960 |
| MEM30522 | Certificate III in Engineering - Technical | 409 | 430 |
| MEM30619 | Certificate III in Jewellery Manufacture | 950 | 1000 |
| MEM30719 | Certificate III in Marine Craft Construction | 950 | 1000 |
| MEM30819 | Certificate III in Locksmithing | 950 | 1000 |
| MEM30919 | Certificate III in Boating Services | 608 | 640 |
| MEM31019 | Certificate III in Watch and Clock Service and Repair | 950 | 1000 |
| MEM31119 | Certificate III in Engineering - Composites Trade | 950 | 1000 |
| MEM31219 | Certificate III in Engineering - Industrial Electrician | 1045 | 1100 |
| MEM31322 | Certificate III in Refrigeration and Air Conditioning | 950 | 1000 |
| MEM31419 | Certificate III in Engineering - Fixed and Mobile Plant Mechanic | 950 | 1000 |
| MEM31519 | Certificate III in Engineering - Toolmaking Trade | 1064 | 1120 |
| MEM31622 | Certificate III in Engineering - Patternmaking Trade | 1074 | 1130 |
| MEM31719 | Certificate III in Engineering - Casting and Moulding Trade | 950 | 1000 |
| MEM31822 | Certificate III in Engineering - Textile Mechanic | 912 | 960 |
| MEM31922 | Certificate III in Engineering - Fabrication Trade | 1017 | 1070 |
| MEM40119 | Certificate IV in Engineering | 1292 | 1360 |
| MEM40222 | Certificate IV in Boating Services | 846 | 890 |
| MEM40322 | Certificate IV in Advanced Jewellery Manufacture | 1292 | 1360 |
| MEM40422 | Certificate IV in Engineering Drafting | 713 | 750 |
| MEM50119 | Diploma of Engineering - Advanced Trade | 1539 | 1620 |
| MEM50222 | Diploma of Engineering - Technical | 1235 | 1300 |
| MEM50322 | Diploma of Jewellery and Object Design | 969 | 1020 |
| MEM50422 | Diploma of Engineering - Non-Destructive Testing | 1235 | 1300 |
| MEM50522 | Diploma of Engineering - Materials | 1406 | 1480 |
| MEM50622 | Diploma of Engineering - Prototyping | 1340 | 1410 |
| MEM50722 | Diploma of Engineering - Planning | 1321 | 1390 |
| MEM50822 | Diploma of Applied Technologies | 1150 | 1210 |
| MEM60122 | Advanced Diploma of Engineering | 1805 | 1900 |
| MEM60222 | Advanced Diploma of Jewellery and Object Design | 1596 | 1680 |
| MEM60322 | Advanced Diploma of Engineering - Planning | 1815 | 1910 |
| MEM80122 | Graduate Diploma of Engineering | 599 | 630 |

# 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 |
| 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 |
| MEM04026 | Develop and manufacture spur gear patterns    | 20 |
| MEM04027 | Develop and manufacture bevel gear patterns    | 20 |
| MEM04028 | Develop and manufacture chain gear and sprocket patterns    | 20 |
| MEM04029 | Develop and manufacture conveyor screw patterns    | 20 |
| MEM04030 | Develop and manufacture propeller patterns    | 30 |
| MEM04031 | Develop and manufacture flat back wood patterns    | 40 |
| MEM04032 | Develop and manufacture irregular joint wood patterns    | 40 |
| MEM04033 | Develop and manufacture turned wood patterns    | 40 |
| MEM04034 | Develop and manufacture wooden wheel patterns | 40 |
| MEM04035 | Develop and manufacture pipe patterns    | 40 |
| MEM04036 | Maintain patterns    | 40 |
| MEM04037 | Develop and manufacture split patterns    | 20 |
| MEM04038 | Produce polymer patterns    | 80 |
| MEM04039 | Assemble plated patterns    | 80 |
| MEM04040 | Develop and manufacture polystyrene patterns    | 20 |
| MEM04041 | Develop and manufacture production patterns    | 80 |
| MEM04042 | Develop and manufacture vacuum forming moulds and associated equipment    | 60 |
| MEM04043 | Develop and manufacture precision models    | 60 |
| 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 |
| MEM05009 | Perform automated thermal cutting    | 20 |
| MEM05010 | Apply fabrication, forming and shaping techniques    | 80 |
| MEM05012 | Perform routine manual metal arc welding    | 20 |
| MEM05013 | Perform manual production welding    | 20 |
| MEM05014 | Monitor quality of production welding/fabrications    | 20 |
| MEM05027 | Perform aluminothermic welding    | 20 |
| 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 |
| MEM05049 | Perform routine gas tungsten arc welding    | 20 |
| MEM05050 | Perform routine gas metal arc welding    | 20 |
| MEM05052 | Apply safe welding practices    | 40 |
| MEM05056 | Perform routine flux core arc welding  | 20 |
| MEM05057 | Perform routine submerged arc welding    | 20 |
| MEM05059 | Perform advanced welding using submerged arc welding    | 40 |
| MEM05060 | Perform welds to code standards using submerged arc welding process    | 40 |
| MEM05061 | Apply basic metallurgy principles to welding applications    | 60 |
| MEM05062 | Apply welding and welding related codes and standards    | 20 |
| MEM05063 | Write and proof robotic welding system programs    | 60 |
| MEM05064 | Establish and maintain a weld record management system    | 20 |
| MEM05065 | Maintain weld records    | 20 |
| MEM05066 | Develop and maintain welding procedures    | 60 |
| MEM05067 | Establish and maintain a welding procedure management system    | 40 |
| MEM05068 | Apply welding procedure specifications    | 60 |
| MEM05069 | Undertake advanced weld repair and maintenance    | 60 |
| MEM05070 | Write and proof programs for NC/CNC thermal cutting machines    | 60 |
| MEM05071 | Perform advanced manual thermal cutting, gouging and shaping    | 20 |
| MEM05072 | Perform advanced welding using manual metal arc welding process    | 60 |
| MEM05073 | Perform advanced welding using gas metal arc welding process    | 60 |
| MEM05074 | Perform advanced welding using gas tungsten arc welding process    | 60 |
| MEM05075 | Perform advanced welding using oxy acetylene welding process    | 60 |
| MEM05076 | Perform welding supervision    | 80 |
| MEM05077 | Perform welding inspection    | 120 |
| MEM05078 | Apply welding principles    | 40 |
| MEM05079 | Perform welds to code standards using flux core arc welding process    | 60 |
| MEM05080 | Perform welds to code standards using gas metal arc welding process    | 60 |
| MEM05081 | Perform welds to code standards using gas tungsten arc welding process    | 60 |
| MEM05082 | Perform pipe welds to code standards using manual metal arc welding process    | 60 |
| MEM05083 | Perform welds to code standards using manual metal arc welding process    | 60 |
| MEM05084 | Perform advanced welding using flux core arc welding process    | 40 |
| MEM05085 | Select welding processes    | 20 |
| MEM05086 | Set and edit computer controlled thermal cutting machines    | 40 |
| MEM05087 | Write basic NC/CNC programs for thermal cutting machines    | 40 |
| MEM05088 | Perform welds to code standards using oxy fuel gas welding process    | 60 |
| MEM05089 | Assemble fabricated components    | 80 |
| MEM05090 | Weld using manual metal arc welding process    | 40 |
| MEM05091 | Weld using gas metal arc welding process    | 40 |
| MEM05092 | Weld using gas tungsten arc welding process    | 40 |
| MEM05093 | Weld using submerged arc welding process    | 40 |
| MEM05094 | Repair, replace and/or modify fabrications    | 40 |
| MEM05095 | Weld using flame powder spraying    | 40 |
| MEM05096 | Weld using flux core arc welding process    | 40 |
| MEM05097 | Weld using oxy fuel gas welding process  | 40 |
| 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 |
| MEM09155 | Prepare mechanical models for computer-aided engineering (CAE)    | 60 |
| MEM09156 | Prepare mechatronic models for computer-aided engineering (CAE)    | 60 |
| MEM09157 | Perform mechanical engineering design drafting    | 80 |
| MEM09158 | Perform mechatronics engineering design drafting    | 80 |
| MEM09201 | Work effectively in an engineering drafting workplace    | 20 |
| MEM09202 | Produce freehand sketches    | 40 |
| MEM09203 | Measure and sketch site information    | 40 |
| MEM09204 | Produce basic engineering detail drawings    | 80 |
| MEM09205 | Produce electrical schematic drawings    | 80 |
| MEM09206 | Produce drawings for mechanical services    | 60 |
| MEM09207 | Produce drawings for reticulated services    | 60 |
| MEM09208 | Detail fasteners and locking devices in mechanical drawings    | 40 |
| MEM09209 | Detail bearings, seals and other componentry in mechanical drawings    | 40 |
| MEM09210 | Create 3D solid models using computer-aided design (CAD) system    | 80 |
| MEM09211 | Produce drawings or models for industrial piping    | 60 |
| MEM09212 | Produce detailed drawings of steel to non-steel connections    | 60 |
| MEM09213 | Produce schematic drawings for hydraulic and pneumatic fluid power systems    | 60 |
| MEM09214 | Perform advanced engineering detail drafting    | 80 |
| MEM09215 | Supervise detail drafting projects    | 40 |
| MEM09216 | Interpret and produce curved 3D shapes and patterns    | 40 |
| MEM09217 | Prepare plans for pipe and duct fabrication  | 40 |
| MEM09218 | Participate in drafting projects for building services    | 40 |
| MEM09219 | Prepare drawings for fabricated sheet metal products    | 40 |
| MEM09220 | Apply surface modelling techniques to 3D drawings    | 80 |
| MEM09221 | Create 3D model assemblies using computer-aided design (CAD) system    | 80 |
| MEM09222 | Interpret and maintain or restore original drawings    | 20 |
| MEM09223 | Interpret design specifications for structural steel detailing    | 40 |
| MEM09224 | Detail bolts and welds for structural steelwork connections    | 20 |
| MEM09225 | Detail standardised structural connections    | 60 |
| MEM09226 | Detail structural steel members    | 80 |
| MEM09227 | Establish structural steel detailing project arrangements    | 60 |
| MEM09228 | Detail ancillary steelwork    | 40 |
| MEM09229 | Read and interpret technical engineering drawings    | 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 |
| MEM10012 | Erect structures    | 40 |
| 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 |
| 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 |
| 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 |
| MEM13018 | Work safely with ionizing radiation    | 40 |
| MEM13019 | Undertake work health and safety activities in the workplace    | 30 |
| MEM13020 | Supervise work health and safety in an industrial work environment    | 40 |
| MEM14001 | Schedule material deliveries    | 80 |
| MEM14002 | Undertake basic process planning    | 80 |
| MEM14003 | Undertake production scheduling    | 80 |
| MEM14006 | Plan work activities    | 40 |
| MEM14085 | Apply mechanical engineering analysis techniques    | 60 |
| MEM14086 | Apply mechatronic engineering analysis techniques    | 60 |
| MEM14087 | Apply manufactured product design techniques    | 60 |
| MEM14088 | Apply maintenance engineering techniques to equipment and component repairs and modifications    | 80 |
| MEM14089 | Integrate mechanical fundamentals into an engineering task    | 60 |
| MEM14090 | Integrate mechatronic fundamentals into an engineering task    | 60 |
| MEM14091 | Integrate manufacturing fundamentals into an engineering task    | 60 |
| MEM14092 | Integrate maintenance fundamentals into an engineering task    | 60 |
| 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 |
| MEM15015 | Examine trading practices    | 50 |
| MEM15016 | Inspect pre-packed articles    | 80 |
| MEM15017 | Use and maintain reference standards    | 30 |
| MEM15018 | Investigate consumer complaints    | 60 |
| MEM15019 | Conduct a field inspection    | 120 |
| MEM15020 | Perform inspection of measuring instruments    | 120 |
| MEM15021 | Conduct audits of servicing licensees and public weighbridge licensees    | 40 |
| MEM15022 | Verify reference standards    | 80 |
| 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 |
| MEM18070 | Modify complex electrical circuits and systems    | 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 multistage, 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 |
| MEM19023 | Apply drawing and rendering techniques to jewellery or object design    | 40 |
| MEM19024 | Use computer-aided design (CAD) to create and display 3D jewellery or object models    | 40 |
| MEM19025 | Create and present designs for jewellery or other 3D objects    | 40 |
| MEM19026 | Investigate quality and application of jewellery materials    | 20 |
| MEM19027 | Produce life drawings for presenting jewellery or object designs    | 60 |
| MEM19028 | Select materials and new technologies for jewellery or 3D object design applications    | 40 |
| MEM19029 | Produce a professional jewellery design or 3D object portfolio    | 60 |
| MEM19030 | Research and recommend sustainable design improvements    | 40 |
| MEM19031 | Produce renderings and technical drawings for jewellery or object design construction    | 40 |
| MEM19032 | Design and implement mechanisms in jewellery items    | 60 |
| MEM19033 | Create silversmithing objects    | 60 |
| MEM19034 | Apply chain manufacture process    | 40 |
| MEM19035 | Plan and apply casting techniques for jewellery or object designs    | 40 |
| MEM19036 | Use specialised techniques to produce jewellery or objects    | 80 |
| MEM19037 | Plan and implement chenier fabrication process    | 20 |
| MEM19038 | Apply traditional techniques to jewellery or 3D object production    | 60 |
| MEM19039 | Plan, conduct and supervise a jewellery or object exhibition or program    | 60 |
| MEM19040 | Create and manufacture jewellery or object design prototypes for the mass market    | 60 |
| MEM19041 | Experiment with jewellery or object designs    | 60 |
| MEM19042 | Render images using computer graphics software    | 60 |
| MEM19043 | Oversee jewellery or object design production    | 80 |
| MEM19044 | Repair and restore antique jewellery    | 40 |
| MEM19045 | Set gems in channel style settings    | 40 |
| MEM19046 | Apply grain setting techniques    | 40 |
| MEM19047 | Set gems in claw and bezel style settings    | 40 |
| MEM19048 | Develop and apply complex borders and decorations for hand engraving    | 60 |
| MEM19049 | Develop and apply heraldic designs for hand engraving    | 60 |
| MEM19050 | Hand carve engraving work    | 60 |
| MEM19051 | Construct multiple stone settings    | 40 |
| MEM19052 | Produce complex objects using silversmithing techniques    | 60 |
| MEM19053 | Create complex findings and mechanisms for jewellery items    | 60 |
| MEM19054 | Fabricate platinum jewellery items    | 40 |
| MEM19057 | Research the gemstone market and complete pre-cutting processes    | 30 |
| MEM19058 | Cut and polish solid gemstones    | 80 |
| MEM19059 | Complete pre-cutting processes for gemstone assemblies    | 30 |
| MEM19060 | Cut and polish a gemstone assembly    | 80 |
| MEM19061 | Carve and polish gemstones    | 80 |
| MEM19062 | Production cut and polish gemstones    | 40 |
| MEM19063 | Use a faceting machine    | 40 |
| MEM19064 | Cut gemstone spheres and beads    | 30 |
| MEM19065 | Obtain rough and polished gemstones    | 10 |
| MEM19066 | Identify the requirements for establishing a gemstone-cutting workshop    | 20 |
| MEM19067 | Apply advanced pre-cutting processes to complex gemstones    | 40 |
| MEM20015 | Produce hand cut keys    | 20 |
| MEM20016 | Produce keys by cutting to code    | 20 |
| MEM20017 | Produce keys by duplication    | 20 |
| MEM20018 | Identify and program transponder keys    | 20 |
| MEM20019 | Service automotive transponder systems using diagnostic equipment    | 20 |
| MEM20020 | Use EEPROM programmers to service automotive transponder systems    | 20 |
| MEM20021 | Perform a building security inspection    | 30 |
| MEM20022 | Modify and repair security equipment and systems    | 30 |
| MEM20023 | Assemble and test lock mechanisms    | 60 |
| MEM20024 | Install and upgrade locks and hardware    | 40 |
| MEM20025 | Gain entry    | 40 |
| MEM20026 | Install and maintain door control devices and systems    | 20 |
| MEM20027 | Maintain and service mechanical locking devices    | 60 |
| MEM20028 | Plan and prepare a master key system    | 60 |
| MEM20029 | Develop and implement a master key system    | 40 |
| MEM20030 | Gain entry and reinstate fire and security containers    | 40 |
| MEM20031 | Gain entry and reinstate automotive locking systems    | 40 |
| MEM20032 | Service and repair fire and security containers    | 60 |
| MEM20033 | Service and repair mechanical automotive locking systems    | 60 |
| MEM20035 | 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 |
| MEM22001 | Perform engineering activities    | 60 |
| MEM22002 | Manage self in the engineering environment    | 40 |
| MEM22007 | Manage environmental effects of engineering activities    | 60 |
| MEM22012 | Coordinate resources for an engineering project or operation    | 60 |
| MEM22013 | Coordinate engineering projects    | 60 |
| MEM22014 | Coordinate engineering-related manufacturing operations    | 60 |
| MEM22015 | Source and estimate engineering materials requirements    | 40 |
| MEM22017 | Coordinate continuous improvement and technical development    | 40 |
| MEM22018 | Coordinate sales and promotion of engineering-related products or services    | 60 |
| MEM23003 | Operate and program computers and/or controllers in engineering situations    | 80 |
| MEM23004 | Apply technical mathematics    | 80 |
| MEM23005 | Apply statistics and probability techniques to engineering tasks    | 40 |
| MEM23006 | Apply fluid and thermodynamics principles in engineering    | 80 |
| MEM23007 | Apply calculus to engineering tasks    | 80 |
| MEM23008 | Apply advanced algebra and numerical methods to engineering tasks    | 120 |
| MEM23052 | Apply basic electro and control scientific principles and techniques in aeronautical engineering    | 60 |
| MEM23063 | Select and organise mechanical engineering material tests    | 60 |
| MEM23064 | Select and organise mechatronic engineering material tests    | 60 |
| MEM23086 | Apply scientific principles and techniques in avionic engineering situations    | 60 |
| MEM23109 | Apply engineering mechanics principles    | 60 |
| MEM23111 | Select electrical equipment and components for engineering applications    | 60 |
| MEM23112 | Investigate electrical and electronic controllers in engineering applications    | 40 |
| MEM23113 | Evaluate hydrodynamic systems and system components    | 60 |
| MEM23114 | Evaluate thermodynamic systems and components    | 60 |
| MEM23115 | Evaluate fluid power systems    | 60 |
| MEM23116 | Evaluate programmable logic controller and related control system component applications    | 60 |
| MEM23117 | Evaluate microcontroller applications    | 60 |
| MEM23118 | Apply production and service control techniques    | 80 |
| MEM23119 | Evaluate continuous improvement processes    | 80 |
| MEM23120 | Select mechanical machine and equipment components    | 80 |
| MEM23121 | Analyse loads on frames and mechanisms    | 80 |
| MEM23122 | Evaluate computer integrated manufacturing systems    | 80 |
| MEM23123 | Evaluate manufacturing processes    | 60 |
| MEM23124 | Measure and analyse noise and vibration    | 60 |
| MEM23125 | Evaluate maintenance systems    | 60 |
| MEM23126 | Evaluate industrial robotic applications    | 60 |
| MEM23129 | Evaluate thermal loads for heating, ventilation, air conditioning and refrigeration    | 80 |
| MEM23130 | Coordinate servicing and fault-finding of HVACR control systems    | 60 |
| MEM23131 | Evaluate rapid prototyping applications    | 60 |
| MEM23132 | Evaluate rapid manufacturing processes    | 60 |
| MEM23133 | Evaluate rapid tooling applications    | 60 |
| MEM23134 | Evaluate jigs and fixtures    | 40 |
| MEM23135 | Evaluate moulding tools and processes    | 40 |
| MEM23136 | Evaluate stamping and forging tools    | 40 |
| MEM23137 | Evaluate rolling tools and processes    | 40 |
| MEM23138 | Evaluate suitability of materials for engineering-related applications    | 40 |
| MEM23139 | Design a basic single zone duct distribution system    | 40 |
| MEM23140 | Determine operational parameters for building HVAC hydronic systems    | 40 |
| MEM23141 | Complete a building thermal performance survey    | 80 |
| MEM23142 | Determine psychrometric processes and system performance    | 60 |
| MEM23143 | Apply energy management principles    | 80 |
| MEM23144 | Contribute to the design of a commercial refrigeration system    | 100 |
| MEM23145 | Apply codes and regulations to air conditioning designs    | 80 |
| MEM23146 | Contribute to the design of industrial refrigeration systems    | 80 |
| MEM23147 | Contribute to the design of hydronic systems    | 40 |
| MEM23148 | Develop energy management solutions    | 40 |
| MEM23149 | Contribute to the design of commercial and industrial exhaust systems    | 40 |
| MEM23150 | Contribute to the design of heating systems    | 40 |
| MEM23151 | Commission and optimise performance of HVACR systems    | 40 |
| MEM23152 | Apply principles of refrigeration food storage technology    | 40 |
| MEM23153 | Contribute to the design of heat exchanger systems    | 40 |
| MEM23154 | Analyse and service HVACR systems    | 80 |
| MEM234001 | Plan and manage engineering-related projects or operations    | 40 |
| MEM234002 | Integrate engineering technologies    | 40 |
| MEM234003 | Design machines and ancillary equipment    | 60 |
| MEM234004 | Design for engineering-related noise and vibration mitigation    | 60 |
| MEM234005 | Design hydrodynamic pumping systems    | 60 |
| MEM234006 | Evaluate and select thermodynamic systems or subsystems    | 40 |
| MEM234007 | Design fluid power systems    | 40 |
| MEM234008 | Design plant using computer simulations    | 40 |
| MEM234009 | Design computer-integrated manufacturing systems    | 60 |
| MEM234010 | Design microcontroller applications    | 40 |
| MEM234011 | Design programmable logic controller applications    | 60 |
| MEM234012 | Design integrated maintenance management systems    | 60 |
| MEM234013 | Plan and design engineering-related manufacturing processes    | 60 |
| MEM234014 | Design a robotic system    | 40 |
| MEM234015 | Design hydronic heat exchanger systems    | 40 |
| MEM234016 | Design refrigeration systems    | 40 |
| MEM234017 | Design exhaust, ventilation and dust collection systems    | 40 |
| MEM234018 | Design heating, ventilation, air conditioning and refrigeration control systems    | 60 |
| MEM234019 | Apply finite element analysis in engineering design    | 40 |
| MEM234020 | Coordinate small lot manufacture using rapid manufacture processes    | 40 |
| MEM234021 | Apply statistics to technology problems    | 40 |
| MEM234022 | Apply advanced calculus to technology problems    | 40 |
| MEM234023 | Apply differential equations to technology problems    | 40 |
| MEM234024 | Apply advanced mathematics to technology problems    | 40 |
| MEM234025 | Apply numerical methods to technology problems    | 40 |
| MEM234026 | Develop and coordinate engineering-related contingency plans    | 40 |
| MEM234027 | Plan and manage materials supply for an engineering project or manufacturing operation    | 40 |
| MEM234028 | Produce and manage technical documentation    | 40 |
| MEM234029 | Produce and manage technical publications    | 40 |
| MEM234030 | Provide specialised technical and engineering guidance to other technical employees  | 40 |
| MEM234031 | Manage installation, commissioning or modification of machines and equipment    | 60 |
| MEM234032 | Manage fluid power-related technologies in an organisation    | 40 |
| MEM234033 | Lead engineering-related quality operations in an organisation    | 40 |
| MEM234034 | Manage heating, ventilation, air conditioning and refrigeration systems or projects    | 40 |
| MEM234035 | Maintain and apply technical and engineering skills    | 40 |
| MEM234036 | Apply configuration management procedures in engineering project management    | 80 |
| MEM234037 | Perform maintenance-related integrated logistic support management activities    | 80 |
| MEM234038 | Apply systems engineering procedures to engineering design project management    | 80 |
| MEM234039 | Provide technical support for prototyping in large engineering and fabrication projects | 40 |
| MEM234040 | Plan space allocation for large steel based fabrication and construction projects | 40 |
| MEM234041 | Manage steel supply for major fabrication projects | 40 |
| MEM24001 | Perform basic penetrant testing    | 20 |
| MEM24002 | Perform penetrant testing    | 40 |
| MEM24003 | Perform basic magnetic particle testing    | 20 |
| MEM24004 | Perform magnetic particle testing    | 40 |
| MEM24005 | Perform basic eddy current testing    | 20 |
| MEM24006 | Perform eddy current testing    | 60 |
| MEM24007 | Perform ultrasonic thickness testing    | 20 |
| MEM24008 | Perform ultrasonic testing    | 60 |
| MEM24009 | Perform basic radiographic testing    | 20 |
| MEM24010 | Perform radiographic testing    | 60 |
| MEM24011 | Establish non-destructive tests    | 120 |
| MEM24012 | Apply metallurgical principles    | 40 |
| MEM24014 | Perform thermography tests | 100 |
| MEM24015 | Perform digital and computed radiography | 60 |
| MEM24016 | Perform eddy current array tests | 60 |
| MEM24017 | Perform visual testing to non-destructive testing standards | 100 |
| MEM24018 | Perform advanced ultrasonic testing | 80 |
| MEM24019 | Apply codes and standards to non-destructive testing | 20 |
| MEM24020 | Apply materials technology principles to non-destructive tests | 60 |
| 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 fabrication    | 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 systems    | 30 |
| MEM27009 | Diagnose and rectify braking systems    | 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 transmissions    | 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 engines    | 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 |
| MEM29001 | Work in Industry 4.0 | 40 |
| MEM29002 | Commission a cyber-physical system | 80 |
| MEM29003 | Apply CAD and CAM technologies in an Industry 4.0 workplace | 80 |
| MEM29004 | Analyse and problem solve a PLC based industrial control system | 100 |
| MEM29005 | Diagnose faults in digital control systems | 80 |
| MEM29006 | Use a SCADA system to assist Industry 4.0 operations in manufacturing and engineering | 100 |
| MEM29007 | Apply networking technology principles for manufacturing and engineering applications | 90 |
| MEM29008 | Analyse and manage data in cloud-based systems | 80 |
| MEM29009 | Prepare, configure and test collaborative robots for industrial operations | 80 |
| MEM29010 | Plan and implement preventative maintenance procedures in an Industry 4.0 manufacturing workplace | 80 |
| MEM29011 | Develop a business case for Industry 4.0 implementation in a workplace | 60 |
| MEM29012 | Access and use a digital twin for operational purposes | 50 |
| MEM29013 | Integrate sensors into digital manufacturing processes | 50 |
| MEM30005 | Calculate force systems within simple beam structures    | 40 |
| MEM30006 | Calculate stresses in simple structures    | 40 |
| MEM30007 | Select common engineering materials    | 40 |
| MEM30008 | Apply basic economic and ergonomic concepts to evaluate engineering applications    | 40 |
| MEM30009 | Contribute to the design of basic mechanical systems    | 40 |
| MEM30010 | Set up basic hydraulic circuits    | 40 |
| MEM30011 | Set up basic pneumatic circuits    | 40 |
| MEM30012 | Apply mathematical techniques in a manufacturing engineering or related environment    | 40 |
| MEM30013 | Assist in the preparation of a basic workplace layout    | 20 |
| MEM30014 | Apply basic just in time systems to the reduction of waste    | 40 |
| MEM30015 | Develop recommendations for basic set up time improvements    | 20 |
| MEM30016 | Assist in the analysis of a supply chain | 20 |
| MEM30017 | Use basic preventative maintenance techniques and tools    | 40 |
| MEM30018 | Undertake basic process planning    | 20 |
| MEM30019 | Use resource planning software systems in manufacturing    | 40 |
| MEM30020 | Develop and manage a plan for a simple manufacturing related project    | 30 |
| MEM30021 | Prepare a simple production schedule    | 20 |
| MEM30022 | Undertake supervised procurement activities    | 20 |
| MEM30023 | Prepare a simple cost estimate for a manufactured product    | 20 |
| MEM30024 | Participate in quality assurance techniques    | 30 |
| MEM30025 | Analyse a simple electrical system circuit    | 40 |
| MEM30026 | Select and test components for simple electronic switching and timing circuits    | 20 |
| MEM30027 | Prepare basic programs for programmable logic controllers    | 20 |
| MEM30028 | Assist in sales of technical products    | 20 |
| MEM30029 | Use workshop equipment and processes to complete an engineering project    | 60 |
| MEM30031 | Operate computer-aided design (CAD) system to produce basic drawing elements    | 40 |
| MEM30032 | Produce basic engineering drawings    | 80 |
| MEM30033 | Use computer-aided design (CAD) to create and display 3D models    | 40 |
| MEM48001 | Test the mechanical properties of materials    | 30 |
| MEM48002 | Monitor ferrous melting and casting processes    | 30 |
| MEM48003 | Monitor nonferrous melting and casting processes    | 30 |
| MEM48004 | Interpret basic binary phase diagrams    | 20 |
| MEM48005 | Apply basic knowledge of casting operations    | 30 |
| MEM48006 | Prepare and examine metallographic samples    | 40 |
| MEM48007 | Monitor and test sands, cores and moulds    | 40 |
| MEM48008 | Evaluate mould design and gating    | 40 |
| MEM48009 | Undertake and interpret results of chemical analysis on metal samples    | 50 |
| MEM48010 | Determine and supervise heat treatment of metal    | 40 |
| MEM48011 | Apply basic chemical principles to metallurgy    | 60 |
| MEM48012 | Calculate and predict chemical outcomes in metallurgical situations    | 40 |
| MEM48013 | Identify and select equipment for mineral and chemical processing plants    | 40 |
| MEM48014 | Recommend a refractory for an application    | 40 |
| MEM48015 | Select metal forming process    | 50 |
| MEM48016 | Select metal joining process    | 50 |
| MEM48017 | Monitor blast furnace operations    | 50 |
| MEM48018 | Monitor primary steel making process    | 50 |
| MEM48019 | Monitor secondary steel making operations    | 50 |
| MEM48020 | Recommend ferrous and nonferrous metals or alloys for an application    | 50 |
| MEM48021 | Apply metallurgical principles and techniques in welding and other thermal processes    | 60 |
| MEM48022 | Apply metallurgical principles and practice to determine metal forming and shaping processes    | 60 |
| MEM48023 | Apply metallurgical principles and practice to optimise furnace operation    | 60 |
| MEM48024 | Plan and complete metallurgical projects    | 40 |
| MEM48025 | Select surface treatment methods for metallic components or products    | 40 |
| MEM48026 | Analyse metallurgical failures of components and recommend preventative measures    | 60 |
| MEM48027 | Select non-metallic materials for engineering applications    | 60 |
| MEM48028 | Determine corrosion prevention strategies for metal and alloys    | 60 |
| MEM48029 | Interpret and produce complex binary phase diagrams    | 40 |
| MEM48030 | Apply materials selection analysis techniques | 120 |
| MEM48031 | Select ceramic and glass materials for engineering and manufacturing applications | 40 |
| MEM48032 | Select composite materials for engineering and manufacturing applications | 80 |
| MEM48033 | Apply chemistry principles to materials used in manufacturing and engineering processes | 80 |
| MEM48034 | Apply efficient materials management techniques to composite manufacturing operations | 60 |
| 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 |
| MEMPE001 | Use engineering workshop machines    | 60 |
| MEMPE002 | Use electric welding machines    | 40 |
| MEMPE003 | Use oxy-acetylene and soldering equipment    | 40 |
| MEMPE004 | Use fabrication equipment    | 40 |
| MEMPE005 | Develop a career plan for the engineering and manufacturing industries    | 20 |
| MEMPE006 | Undertake a basic engineering project    | 80 |
| MEMPE007 | Pull apart and re-assemble engineering mechanisms  | 30 |

# CONTACTS AND LINKS

Curriculum Maintenance Manager (CMM) Service

Engineering Industries

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.

Steve Bryant

Box Hill Institute

465 Elgar Rd Box Hill, Vic. 3127

Phone: (03) 9286 9934 or 0479 184 251

Email: cmmei@boxhill.edu.au or steven.bryant@boxhill.edu.au

Manufacturing Jobs and Skills Council (JSC) – IBSA

The Manufacturing Jobs and Skills Council supports industry and training providers in manufacturing and engineering, light manufacturing including pharmaceuticals, print, food and advanced manufacturing, and emerging industries including space and defence technologies. IBSA Manufacturing is responsible for developing the MEM Manufacturing and Engineering Training Package and can be contacted for further information.

Address: Level 5, 534 Church Street, Cremorne, VIC 3121

Phone: 03 9815 7000

Email: manufacturing@ibsa.org.au

Website: [www.ibsa.org.au](https://www.ibsa.org.au/)

National Register of 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. See [training.gov.au](http://training.gov.au/) for more information.

Australian Government - Department of Employment and Workplace Relations (DEWR)

The Commonwealth Department is responsible for national policies and programmes that help Australians access quality vocational education and training. See [Skills and Training - DEWR](https://www.dese.gov.au/skills-and-training) for more information.

State Government - Department of Jobs, Skills, Industry and Regions (DJSIR)

DJSIR (formerly Department of Education and Training) is the State Training Authority responsible for supporting implementation of Vocational Education and Training (VET) in Victoria. See [djsir.vic.gov.au](https://djsir.vic.gov.au/) for more information. (03) 9637 2000

National VET Regulatory Authority - Australian Skills Quality Authority (ASQA)

ASQA is the national regulator for Australia’s VET sector. Info line: 1300 701 801 See [asqa.gov.au](http://www.asqa.gov.au/) for more information.

State 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 See [vrqa.vic.gov.au](http://www.vrqa.vic.gov.au/)

# 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.

(03) 9203 9700

info@esv.vic.gov.au

See [esv.vic.gov.au](https://www.esv.vic.gov.au/) for further information.

**Australian Refrigeration Council Ltd (ARC)**

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.

Level 1

818 Whitehorse Road

Box Hill VIC 3128

1300 88 44 83

enquire@arctick.org

See [arctick.org](https://www.arctick.org/) for further information

WorkSafe 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.

WorkSafe needs to provide written verification before high risk work units can be added to an RTO’s scope of registration. info@worksafe.vic.gov.au See [worksafe.vic.gov.au](http://www.worksafe.vic.gov.au/) for further information.

222 Exhibition Street,

Melbourne 3000

(03) 9641 1444 or

1800 136 089 (toll free)

# GLOSSARY

**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 (DJSIR) and are primarily developed for funding purposes in Victoria.