**Victorian Purchasing Guide**

**for**

**MEM05 Metal and Engineering Training Package**

**Version 10**

**October 2013**



© State of Victoria (Department of Education and Early Childhood Development) 2013.

Copyright of this material is reserved to the Crown in the right of the State of Victoria. This work is licensed under a Creative Commons Attribution-NoDerivs 3.0 Australia licence (<http://creativecommons.org/licenses/by-nd/3.0/au/>). You are free use, copy and distribute to anyone in its original form as long as you attribute Skills Victoria, Department of Education and Early Childhood Development as the author, and you license any derivative work you make available under the same licence.

**Disclaimer**

In compiling the information contained in and accessed through this resource, the Department of Education and Early Childhood Development (DEECD) has used its best endeavours to ensure that the information is correct and current at the time of publication but takes no responsibility for any error, omission or defect therein.

To the extent permitted by law DEECD, its employees, agents and consultants exclude all liability for any loss or damage (including indirect, special or consequential loss or damage) arising from the use of, or reliance on the information contained herein, whether caused or not by any negligent act or omission. If any law prohibits the exclusion of such liability, DEECD limits its liability to the extent permitted by law, for the resupply of the information.

**Third party sites**

This resource may contain links to third party websites and resources. DEECD is not responsible for the condition or content of these sites or resources as they are not under its control.

Third party material linked from this resource is subject to the copyright conditions of the third party. Users will need to consult the copyright notice of the third party sites for conditions of usage.

Victorian Purchasing Guide ⎯ Version History

|  |  |  |
| --- | --- | --- |
| Training Package Version  | Date VPGApproved | Comments |
| MEM05 Metals and Engineering Training Package V10 | 28th October 2013 | * 3 new MEM units of competency
 |
| MEM05 Metals and Engineering Training Package V9 | 25th March 2013  | * 74 new MEM units of competency
* 32 existing MEM units replaced/not carried forward
* Three updated qualifications with the inclusion of a range of additional electives:
* MEM50212 Diploma of Engineering – Technical
* MEM60112 Advanced Diploma of Engineering
* MEM80112 Vocational Graduate Diploma of Engineering
 |
| MEM05 Metals and Engineering Training Package V8 | 15th October 2012 | One new qualification: * MEM40412 Certificate IV in Engineering Drafting
* 25 new units of competency
* 4 existing units replaced
* Six additional imported units of competency.
 |
| MEM05 Metals and Engineering Training Package V7 | 27th June 2012 | 1. new qualification
* MEM31112 Certificate III in Engineering - Composites Trade
* 21 new units of competency
 |
| MEM05 Metals and Engineering Training Package V6  | 8th May 2012 | 2 new qualifications * MEM40311 Certificate IV in Advanced Jewellery Manufacture
* MEM80111 Vocational Graduate Diploma of Engineering
* 46 new units of competency
* 32 new imported units
 |

**MEM05 Metals and Engineering Training Package Victorian Purchasing Guide**

**CONTENTS**

INTRODUCTION 5

What is a Victorian Purchasing Guide? 5

Registration 5

QUALIFICATIONS 6

UNITS OF COMPETENCY AND NOMINAL HOURS 7

SAMPLE TRAINING PROGRAMS 25

CONTACTS AND LINKS 50

GLOSSARY 52

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 nominal hour range (minimum-maximum) available for each qualification.
* Nominal hours for each unit of competency within the Training Package.
* Sample Training Programs

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 Quality Framework (AQF).

The VRQA is the regulatory authority for Victoria that registers VET training organisations who provide courses to domestic students only and who only offer training in Victoria.

To register to provide training to international students and in other Australian states and territories you will need to apply with ASQA.

QUALIFICATIONS

| **Code** | **Title** | **Qualification Nominal Hour Range**  |
| --- | --- | --- |
| **Minimum** | **Maximum** |
| MEM10105 | Certificate I in Engineering | 280 | 280 |
| MEM10205 | Certificate I in Boating Services | 160  | 250 |
| MEM20105 | Certificate II in Engineering  | 320  | 390 |
| MEM20205 | Certificate II in Engineering – Production Technology | 660  | 700 |
| MEM20305 | Certificate II in Boating Services | 210  | 340 |
| MEM30105 | Certificate III in Engineering – Production Systems | 960  | 1000 |
| MEM30205 | Certificate III in Engineering – Mechanical Trade | 960  | 1000 |
| MEM30305 | Certificate III in Engineering – Fabrication Trade | 960  | 1000 |
| MEM30405 | Certificate III in Engineering – Electrical/Electronic Trade | 960  | 1000 |
| MEM30505 | Certificate III in Engineering – Technical | 230  | 430 |
| MEM30605 | Certificate III in Jewellery Manufacture | 960  | 1000 |
| MEM30705 | Certificate III in Marine Craft Construction | 960  | 1000 |
| MEM30805 | Certificate III in Locksmithing | 960  | 1000 |
| MEM30905 | Certificate III in Boating Services | 380  | 640 |
| MEM31010 | Certificate III in Watch and Clock Service and Repair | 960  | 1000 |
| MEM31112 | Certificate III in Engineering - Composites Trade | 960 | 1000 |
| MEM40105 | Certificate IV in Engineering | 1320  | 1360 |
| MEM40205 | Certificate IV in Boating Services | 590  | 890 |
| MEM40311 | Certificate IV in Advanced Jewellery Manufacture | 1320  | 1360 |
| MEM40412 | Certificate IV in Engineering Drafting | 710 | 750 |
| MEM50105 | Diploma of Engineering – Advanced Trade | 1580  | 1620 |
| MEM50212 | Diploma of Engineering – Technical | 600  | 1300 |
| MEM50311 | Diploma of Jewellery and Object Design | 930 | 1020 |
| MEM60112 | Advanced Diploma of Engineering | 1200  | 1900 |
| MEM60211 | Advanced Diploma of Jewellery and Object Design | 1520 | 1680 |
| MEM80112 | Vocational Graduate Diploma of Engineering | 450 | 630 |

UNITS OF COMPETENCY AND NOMINAL HOURS

RTOs are advised that there is a mapping inside the Training Package that describes the relationship between new units and superseded or replaced units from the previous version of **MEM05 Metals and Engineering Training Package.**  Information regarding transition arrangements can be obtained from the state or national VET Regulating Authority (see Contacts and Links section).

You must be sure that all training and assessment leading to qualifications or Statements of Attainment from the **MEM05 Metals and Engineering Training Package** is conducted against the Training Package units of competency and complies with the requirements in the assessment guidelines.

Listing of the Units of Competency and Nominal Hours

| Unit Code | Unit Title | Nominal Hours |
| --- | --- | --- |
| MEM03001B | Perform manual production assembly | 40 |
| MEM03002B | Perform precision assembly | 40 |
| MEM03003B | Perform sheet and plate assembly | 40 |
| MEM03004B | Perform electronic/electrical assembly (production) | 80 |
| MEM03005B | Rework and repair (electrical/electronic production) | 80 |
| MEM03006B | Set assembly stations | 20 |
| MEM04001B | Operate melting furnaces | 40 |
| MEM04002B | Perform gravity die casting | 20 |
| MEM04003B | Operate pressure die casting machine | 20 |
| MEM04004B | Prepare and mix sand for metal moulding | 40 |
| MEM04005C | Produce moulds and cores by hand (jobbing) | 160 |
| MEM04006B | Operate sand moulding and core making machines | 80 |
| MEM04007B | Pour molten metal | 40 |
| MEM04008B | Fettle and trim metal castings/forgings | 40 |
| MEM04010B | Develop and manufacture wood patterns | 200 |
| MEM04011B | Produce polymer patterns | 80 |
| MEM04012B | Assemble plated patterns | 80 |
| MEM04013B | Develop and manufacture polystyrene patterns | 20 |
| MEM04014B | Develop and manufacture production patterns | 80 |
| MEM04015B | Develop and manufacture vacuum forming moulds and associated equipment | 60 |
| MEM04016C | Develop and manufacture precision models | 60 |
| MEM04017B | Develop and manufacture gear, conveyor screw and propeller patterns | 40 |
| MEM04018B | Perform general woodworking machine operations | 40 |
| MEM04019B | Perform refractory installation and repair | 40 |
| MEM04020A | Supervise individual ferrous melting and casting operation | 40 |
| MEM04021A | Supervise individual non ferrous melting and casting operation | 40 |
| MEM04022A | Examine appropriateness of methoding for mould design | 40 |
| MEM04023A | Undertake prescribed tests on foundry related materials | 40 |
| MEM05001B | Perform manual soldering/desoldering - electrical/electronic components | 40 |
| MEM05002B | Perform high reliability soldering and desoldering | 40 |
| MEM05003B | Perform soft soldering | 20 |
| MEM05004C | Perform routine oxy acetylene welding | 20 |
| MEM05005B | Carry out mechanical cutting | 20 |
| MEM05006C | Perform brazing and/or silver soldering | 20 |
| MEM05007C | Perform manual heating and thermal cutting | 20 |
| MEM05008C | Perform advanced manual thermal cutting, gouging and shaping | 20 |
| MEM05009C | Perform automated thermal cutting | 20 |
| MEM05010C | Apply fabrication, forming and shaping techniques | 80 |
| MEM05011D | Assemble fabricated components | 80 |
| MEM05012C | Perform routine manual metal arc welding | 20 |
| MEM05013C | Perform manual production welding | 20 |
| MEM05014C | Monitor quality of production welding/fabrications | 20 |
| MEM05015D | Weld using gas metal arc welding process | 40 |
| MEM05016C | Perform advanced welding using manual metal arc welding process | 40 |
| MEM05017D | Weld using gas metal arc welding process | 40 |
| MEM05018C | Perform advanced welding using gas metal arc welding process | 40 |
| MEM05019D | Weld using gas metal arc welding process | 40 |
| MEM05020C | Perform advanced welding using gas tungsten arc welding process | 40 |
| MEM05022C | Perform advanced welding using oxy acetylene welding process | 60 |
| MEM05023C | Weld using submerged arc welding process | 40 |
| MEM05024B | Perform welding supervision | 120 |
| MEM05025C | Perform welding/fabrication inspection | 120 |
| MEM05026C | Apply welding principles | 40 |
| MEM05027A | Perform aluminothermic welding | 20 |
| MEM05036C | Repair/replace/modify fabrications | 40 |
| MEM05037C | Perform geometric development | 60 |
| MEM05038B | Perform advanced geometric development - cylindrical/rectangular | 20 |
| MEM05039B | Perform advanced geometric development - conical | 20 |
| MEM05040B | Perform advanced geometric development - transitions | 40 |
| MEM05041B | Weld using powder flame spraying | 40 |
| MEM05042B | Perform welds to code standards using flux core arc welding process | 60 |
| MEM05043B | Perform welds to code standards using gas metal arc welding process | 60 |
| MEM05044B | Perform welds to code standards using gas tungsten arc welding process | 60 |
| MEM05045B | Perform pipe welds to code standards using manual metal arc welding process | 60 |
| MEM05046B | Perform welds to code standards using manual metal arc welding process | 60 |
| MEM05047B | Weld using flux core arc welding process | 40 |
| MEM05048B | Perform advanced welding using flux core arc welding process | 40 |
| MEM05049B | Perform routine gas tungsten arc welding | 20 |
| MEM05050B | Perform routine gas metal arc welding | 20 |
| MEM05051A | Select welding processes | 20 |
| MEM05052A | Apply safe welding practices | 40 |
| MEM05053A | Set and edit computer controlled thermal cutting machines | 40 |
| MEM05054A | Write basic NC/CNC programs for thermal cutting machines | 40 |
| MEM06001B | Perform hand forging | 40 |
| MEM06002B | Perform hammer forging | 40 |
| MEM06003C | Carry out heat treatment | 60 |
| MEM06004B | Select heat treatment processes and test finished product | 60 |
| MEM06005B | Perform drop and upset forging | 40 |
| MEM06006C | Repair springs | 40 |
| MEM06007B | Perform basic incidental heat/quenching, tempering and annealing | 20 |
| MEM06008A | Hammer forge complex shapes | 40 |
| MEM06009A | Hand forge complex shapes | 40 |
| MEM07001B | Perform operational maintenance of machines/equipment | 20 |
| MEM07002B | Perform precision shaping/planing/slotting operations | 40 |
| MEM07003B | Perform machine setting (routine) | 40 |
| MEM07004B | Perform machine setting (complex) | 80 |
| MEM07005C | Perform general machining | 80 |
| MEM07006C | Perform lathe operations | 40 |
| MEM07007C | Perform milling operations | 40 |
| MEM07008D | Perform grinding operations | 40 |
| MEM07009B | Perform precision jig boring operations | 40 |
| MEM07010B | Perform tool and cutter grinding operations | 40 |
| MEM07011B | Perform complex milling operations | 40 |
| MEM07012B | Perform complex grinding operations | 40 |
| MEM07013B | Perform machining operations using horizontal and/or vertical boring machines | 40 |
| MEM07014B | Perform electro-discharge (EDM) machining operations | 40 |
| MEM07015B | Set computer controlled machines/processes | 20 |
| MEM07016C | Set and edit computer controlled machines/processes | 40 |
| MEM07018C | Write basic NC/CNC programs | 40 |
| MEM07019C | Program NC/CNC machining centre | 20 |
| MEM07020C | Program multiple spindle and/or multiple axis NC/CNC machining centre | 20 |
| MEM07021B | Perform complex lathe operations | 40 |
| MEM07022C | Program CNC wire cut machines | 20 |
| MEM07023C | Program and set up CNC manufacturing cell | 60 |
| MEM07024B | Operate and monitor machine/process | 40 |
| MEM07025B | Perform advanced machine/process operation | 60 |
| MEM07026B | Perform advanced plastic processing | 60 |
| MEM07027B | Perform advanced press operations | 60 |
| MEM07028B | Operate computer controlled machines/processes | 20 |
| MEM07029B | Perform routine sharpening/maintenance of production tools and cutters | 40 |
| MEM07030C | Perform metal spinning lathe operations (basic) | 80 |
| MEM07031C | Perform metal spinning lathe operations (complex) | 40 |
| MEM07032B | Use workshop machines for basic operations | 20 |
| MEM07033B | Operate and monitor basic boiler | 60 |
| MEM07034A | Operate and monitor intermediate class boiler | 40 |
| MEM07039A | Write programs for industrial robots | 40 |
| MEM07040A | Set multistage integrated processes | 40 |
| MEM07041A | Perform production machining | 80 |
| MEM07042A | Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems | 40 |
| MEM07043A | Identify causes of faulty aluminium extrusions | 60 |
| MEM07044A | Test a new aluminium extrusion die | 40 |
| MEM08001B | Perform wire, jig and barrel load/unload work | 40 |
| MEM08002C | Pre-treat work for subsequent surface coating | 40 |
| MEM08003C | Perform electroplating operations | 60 |
| MEM08004B | Finish work using wet, dry and vapour deposition methods | 40 |
| MEM08005B | Prepare and produce specialised coatings | 40 |
| MEM08006B | Produce clear and/or coloured and/or sealed anodised films on aluminium | 20 |
| MEM08007B | Control surface finish production and finished product quality | 40 |
| MEM08008B | Operate and control surface finishing waste treatment process | 30 |
| MEM08009C | Make up solutions | 20 |
| MEM08010B | Manually finish/polish materials | 60 |
| MEM08011B | Prepare surfaces using solvents and/or mechanical means | 20 |
| MEM08012B | Prepare surfaces by abrasive blasting (basic) | 40 |
| MEM08013B | Prepare surfaces by abrasive blasting (advanced) | 40 |
| MEM08014B | Apply protective coatings (basic) | 40 |
| MEM08015B | Apply protective coatings (advanced) | 40 |
| MEM08016B | Control blast coating by-products, materials and emissions | 10 |
| MEM08018B | Electroplate engineering coatings | 60 |
| MEM08019B | Electroplate protective finishes | 60 |
| MEM08020B | Electroplate decorative finishes | 60 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM09003B | Prepare basic engineering drawing | 80 |
| MEM09004B | Perform electrical/electronic detail drafting | 80 |
| MEM09005B | Perform basic engineering detail drafting | 80 |
| MEM09006B | Perform advanced engineering detail drafting | 40 |
| MEM09007B | Perform advanced mechanical detail drafting | 40 |
| MEM09008B | Perform advanced structural detail drafting | 40 |
| MEM09009C | Create 2D drawings using computer aided design system | 80 |
| MEM09010C | Create 3D models using computer aided design system | 40 |
| MEM09011B | Apply basic engineering design concepts | 60 |
| MEM09021B | Interpret and produce curved 3-dimensional shapes | 40 |
| MEM09022A | Create 2D code files using computer aided manufacturing system | 40 |
| MEM09023A | Create 3D code files using computer aided manufacturing system | 60 |
| MEM09143A |  Represent aeronautical engineering designs  | 80 |
| MEM09144A |  Represent avionic engineering designs  | 80 |
| MEM09153A |  Apply computer-aided modelling and data management techniques to aeronautical engineering designs  | 80 |
| MEM09154A |  Apply computer-aided modelling and data management techniques to avionic engineering designs  | 80 |
| MEM09155A | Prepare mechanical models for computer-aided engineering | 60 |
| MEM09156A | Prepare mechatronic models for computer-aided engineering | 60 |
| MEM09157A | Perform mechanical engineering design drafting | 80 |
| MEM09158A | Perform mechatronics engineering design drafting  | 80 |
| MEM09201A | Work effectively in an engineering drafting workplace | 20 |
| MEM09202A | Produce freehand sketches | 40 |
| MEM09203A | Measure and sketch site information | 40 |
| MEM09204A | Produce engineering detail drawings  | 80 |
| MEM09205A | Produce electrical schematic drawings  | 80 |
| MEM09206A | Produce drawings for mechanical services  | 60 |
| MEM09207A | Produce drawings for reticulated services | 60 |
| MEM09208A | Detail fasteners and locking devices in mechanical drawings | 40 |
| MEM09209A | Detail bearings, seals and other componentry in mechanical drawings | 40 |
| MEM09210A | Create 3-D solid models using computer aided design system | 80 |
| MEM09211A | Produce drawings or models for industrial piping | 60 |
| MEM09212A | Produce detailed drawings of steel to non-steel connections | 60 |
| MEM09213A | Produce schematic drawings for hydraulic and pneumatic fluid power systems | 60 |
| MEM09214A | Perform advanced engineering detail drafting | 80 |
| MEM09215A | Supervise detail drafting projects | 40 |
| MEM09216A | Interpret and produce curved 3-D shapes and patterns | 40 |
| MEM09217A | Prepare plans for pipe and duct fabrication | 40 |
| MEM09218A | Participate in drafting projects for building services | 40 |
| MEM09219A | Prepare drawings for fabricated sheet metal products | 40 |
| MEM09220A | Apply surface modelling techniques to 3-D drawings | 80 |
| MEM09221A | Create 3-D model assemblies using computer aided design system | 80 |
| MEM09222A | Interpret and maintain or restore original drawings | 20 |
| MEM10001C | Erect structures | 40 |
| MEM10002B | Terminate and connect electrical wiring | 30 |
| MEM10003B | Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c. | 120 |
| MEM10004B | Enter and change programmable controller operational parameters | 20 |
| MEM10005B | Commission programmable controller programs | 40 |
| MEM10006B | Install machine/plant | 40 |
| MEM10007C | Modify control systems | 60 |
| MEM10008B | Undertake commissioning procedures for plant and/or equipment | 40 |
| MEM10009B | Install refrigeration and air conditioning plant and equipment | 40 |
| MEM10010B | Install pipework and pipework assemblies | 40 |
| MEM10011B | Terminate and connect specialist cables | 30 |
| MEM10013A | Install split air conditioning systems and associated pipework | 60 |
| MEM11001C | Erect/dismantle scaffolding and equipment | 40 |
| MEM11002C | Erect/dismantle complex scaffolding and equipment | 40 |
| MEM11003B | Coordinate erection/dismantling of complex scaffolding/equipment | 40 |
| MEM11004B | Undertake dogging | 40 |
| MEM11005B | Pick and process order | 40 |
| MEM11006B | Perform production packaging | 20 |
| MEM11007B | Administer inventory procedures | 40 |
| MEM11008B | Package materials (stores and warehouse) | 20 |
| MEM11009B | Handle/move bulk fluids/gases | 40 |
| MEM11010B | Operate mobile load shifting equipment | 40 |
| MEM11011B | Undertake manual handling | 20 |
| MEM11012B | Purchase materials | 60 |
| MEM11013B | Undertake warehouse receival process | 40 |
| MEM11014B | Undertake warehouse dispatch process | 40 |
| MEM11015B | Manage warehouse inventory system | 40 |
| MEM11016B | Order materials | 20 |
| MEM11017B | Organise and lead stocktakes | 40 |
| MEM11018B | Organise and maintain warehouse stock receival and/or dispatch system | 60 |
| MEM11019B | Undertake tool store procedures | 40 |
| MEM11020B | Perform advanced warehouse computer operations | 40 |
| MEM11021B | Perform advanced operation of load shifting equipment | 20 |
| MEM11022B | Operate fixed/moveable load shifting equipment | 40 |
| MEM11023A | Operate a bridge and gantry crane  | 10 |
| MEM11024A | Undertake basic rigging  | 10 |
| MEM11025A | Operate a non-slewing mobile crane of greater than three tonnes capacity  | 10 |
| MEM12001B | Use comparison and basic measuring devices | 20 |
| MEM12002B | Perform electrical/electronic measurement | 20 |
| MEM12003B | Perform precision mechanical measurement | 20 |
| MEM12004B | Perform precision electrical/electronic measurement | 40 |
| MEM12005B | Calibrate measuring equipment | 60 |
| MEM12006C | Mark off/out (general engineering) | 40 |
| MEM12007D | Mark off/out structural fabrications and shapes | 40 |
| MEM12019B | Measure components using coordinate measuring machines | 40 |
| MEM12020B | Set and operate coordinate measuring machines | 20 |
| MEM12021B | Program coordinate measuring machines | 40 |
| MEM12022B | Program coordinate measuring machines (advanced) | 20 |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM12025A | Use graphical techniques and perform simple statistical computations | 20 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM13002B | Undertake occupational health and safety activities in the workplace | 30 |
| MEM13003B | Work safely with industrial chemicals and materials | 20 |
| MEM13004B | Work safely with molten metals/glass | 20 |
| MEM13006B | Collect and evaluate occupational health and safety data for an enterprise or section of an enterprise | 40 |
| MEM13007B | Maintain water treatment systems for cooling towers | 20 |
| MEM13010A | Supervise occupational health and safety in an industrial work environment | 40 |
| MEM13013B | Work safely with ionizing radiation | 40 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14001B | Schedule material deliveries | 80 |
| MEM14002B | Undertake basic process planning | 80 |
| MEM14003B | Undertake basic production scheduling | 80 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM14065A | Plan and design aeronautical engineering projects  | 60 |
| MEM14066A | Plan and design avionic engineering projects | 60 |
| MEM14083A | Apply aeronautical engineering fundamentals to support design and development of engineering projects  | 60 |
| MEM14084A | Apply avionic engineering fundamentals to support design and development of engineering projects  | 60 |
| MEM14085A | Apply mechanical engineering analysis techniques | 60 |
| MEM14086A | Apply mechatronic engineering analysis techniques | 60 |
| MEM14087A | Apply manufactured product design techniques | 60 |
| MEM14088A | Apply maintenance engineering techniques to equipment and component repairs and modifications | 80 |
| MEM14089A | Integrate mechanical fundamentals into an engineering task | 60 |
| MEM14090A | Integrate mechatronic fundamentals into an engineering task | 60 |
| MEM14091A | Integrate manufacturing fundamentals into an engineering task | 60 |
| MEM14092A | Integrate maintenance fundamentals into an engineering task | 60 |
| MEM15001B | Perform basic statistical quality control | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15003B | Use improvement processes in team activities | 40 |
| MEM15004B | Perform inspection | 20 |
| MEM15005B | Select and control inspection processes and procedures | 40 |
| MEM15007B | Conduct product and/or process capability studies | 60 |
| MEM15008B | Perform advanced statistical quality control | 20 |
| MEM15010B | Perform laboratory procedures | 80 |
| MEM15011B | Exercise external quality assurance | 60 |
| MEM15012B | Maintain/supervise the application of quality procedures | 40 |
| MEM15015B | Examine trading practices | 50 |
| MEM15016B | Inspect pre-packed articles | 80 |
| MEM15017B | Use and maintain reference standards | 30 |
| MEM15018B | Investigate consumer complaints | 60 |
| MEM15019B | Conduct a field inspection | 120 |
| MEM15020C | Perform verification/certification or in-service inspection | 120 |
| MEM15021C | Conduct audits of servicing licensees and public weighbridge licensees | 40 |
| MEM15022B | Verify reference standards | 80 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16001B | Give formal presentations and take part in meetings | 20 |
| MEM16002C | Conduct formal interviews and negotiations | 40 |
| MEM16003B | Provide advanced customer service | 20 |
| MEM16004B | Perform internal/external customer service | 20 |
| MEM16005A | Operate as a team member to conduct manufacturing, engineering or related activities | 20 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM16009A | Research and analyse engineering information | 20 |
| MEM16010A | Write reports | 20 |
| MEM16011A | Communicate with individuals and small groups | 20 |
| MEM16012A | Interpret technical specifications and manuals | 40 |
| MEM16013A | Operate in a self-directed team | 20 |
| MEM16014A | Report technical information | 20 |
| MEM17001B | Assist in development and deliver training in the workplace | 20 |
| MEM17002B | Conduct workplace assessment | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
| MEM18003C | Use tools for precision work | 40 |
| MEM18004B | Maintain and overhaul mechanical equipment | 40 |
| MEM18005B | Perform fault diagnosis, installation and removal of bearings | 40 |
| MEM18006C | Repair and fit engineering components | 60 |
| MEM18007B | Maintain and repair mechanical drives and mechanical transmission assemblies | 40 |
| MEM18008B | Balance equipment | 20 |
| MEM18009B | Perform levelling and alignment of machines and engineering components | 40 |
| MEM18010C | Perform equipment condition monitoring and recording | 40 |
| MEM18011C | Shut down and isolate machines/equipment | 20 |
| MEM18012B | Perform installation and removal of mechanical seals | 20 |
| MEM18013B | Perform gland packing | 20 |
| MEM18014B | Manufacture press tools and gauges | 80 |
| MEM18015B | Maintain tools and dies | 40 |
| MEM18016B | Analyse plant and equipment condition monitoring results | 40 |
| MEM18017C | Modify mechanical systems and equipment | 80 |
| MEM18018C | Maintain pneumatic system components | 40 |
| MEM18019B | Maintain pneumatic systems | 40 |
| MEM18020B | Maintain hydraulic system components | 40 |
| MEM18021B | Maintain hydraulic systems | 40 |
| MEM18022B | Maintain fluid power controls | 80 |
| MEM18023B | Modify fluid power system operation | 80 |
| MEM18024B | Maintain engine cooling systems | 20 |
| MEM18025B | Service combustion engines | 20 |
| MEM18026C | Test compression ignition fuel systems | 40 |
| MEM18027C | Overhaul engine fuel system components | 80 |
| MEM18028B | Maintain engine lubrication systems | 20 |
| MEM18029B | Tune diesel engines | 40 |
| MEM18030B | Diagnose and rectify low voltage electrical systems | 80 |
| MEM18031B | Diagnose and rectify low voltage starting systems | 20 |
| MEM18032B | Maintain induction/exhaust systems | 40 |
| MEM18033B | Perform engine bottom-end overhaul | 40 |
| MEM18034B | Perform engine top-end overhaul | 80 |
| MEM18035B | Diagnose and rectify braking systems | 60 |
| MEM18037B | Diagnose and rectify low voltage charging systems | 20 |
| MEM18038B | Maintain wheels and tyres | 20 |
| MEM18039B | Diagnose and rectify track type undercarriage | 40 |
| MEM18040B | Maintain suspension systems | 40 |
| MEM18041B | Maintain steering systems | 40 |
| MEM18042C | Diagnose and rectify manual transmissions | 40 |
| MEM18043C | Diagnose and rectify automatic transmissions | 80 |
| MEM18044C | Diagnose and rectify drive line and final drives | 40 |
| MEM18045B | Fault find/repair electrical equipment/components up to 250 volts single phase supply | 40 |
| MEM18046B | Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c. | 100 |
| MEM18047B | Diagnose and maintain electronic controlling systems on mobile plant | 40 |
| MEM18048B | Fault find and repair/rectify basic electrical circuits | 120 |
| MEM18049C | Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c. | 30 |
| MEM18050C | Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c. | 30 |
| MEM18051B | Fault find and repair/rectify complex electrical circuits | 60 |
| MEM18052B | Maintain fluid power systems for mobile plant | 40 |
| MEM18053B | Modify fluid power control systems | 60 |
| MEM18054B | Fault find, test and calibrate instrumentation systems and equipment | 80 |
| MEM18055B | Dismantle, replace and assemble engineering components | 30 |
| MEM18056B | Diagnose and repair analog equipment and components | 100 |
| MEM18057B | Maintain/service analog/digital electronic equipment | 60 |
| MEM18058C | Modify electronic equipment | 40 |
| MEM18059B | Modify electronic systems | 40 |
| MEM18060B | Maintain, repair control instrumentation - single and multiple loop control systems | 80 |
| MEM18061B | Maintain/calibrate complex control systems | 80 |
| MEM18062B | Install, maintain and calibrate instrumentation sensors, transmitters and final control elements | 80 |
| MEM18063B | Terminate signal and data cables | 40 |
| MEM18064B | Maintain instrumentation system components | 60 |
| MEM18065B | Diagnose and repair digital equipment and components | 100 |
| MEM18066B | Diagnose and repair microprocessor-based equipment | 60 |
| MEM18067B | Tune control loops - multi controller or multi element systems | 60 |
| MEM18069B | Maintain, repair instrumentation process control analysers | 60 |
| MEM18070C | Modify complex electrical circuits and systems | 60 |
| MEM18071B | Connect/disconnect fluid conveying system components | 20 |
| MEM18072B | Manufacture fluid conveying conductor assemblies | 40 |
| MEM18073A | Perform advanced equipment testing and diagnostics on mobile plant and equipment | 80 |
| MEM18084A | Commission and decommission split air conditioning systems | 40 |
| MEM18085A | Install, service and repair domestic air conditioning and refrigeration appliances  | 60 |
| MEM18086B | Test, recover, evacuate and charge refrigeration systems | 40 |
| MEM18087B | Service and repair domestic and light commercial refrigeration and air conditioning equipment | 60 |
| MEM18088B | Maintain and repair commercial air conditioning systems and components | 40 |
| MEM18089B | Maintain and repair central air handling systems | 60 |
| MEM18090B | Maintain and repair industrial refrigeration systems and components | 60 |
| MEM18091B | Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems | 40 |
| MEM18092B | Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls | 60 |
| MEM18093B | Maintain and repair integrated industrial refrigeration and/or large air handling system controls | 80 |
| MEM18094B | Service and repair commercial refrigeration | 60 |
| MEM18095A | Maintain and repair cooling towers/evaporative condensers and associated equipment | 40 |
| MEM18096A | Maintain, repair/replace and adjust refrigerant flow controls and associated equipment | 60 |
| MEM18097A | Manufacture cavity dies | 80 |
| MEM18098A |  Prepare to perform work associated with fuel system installation and servicing  | 20 |
| MEM19001B | Perform jewellery metal casting | 60 |
| MEM19002B | Prepare jewellery illustrations | 40 |
| MEM19003B | Handle gem materials | 20 |
| MEM19004B | Handle and examine gemstone materials | 60 |
| MEM19005B | Produce three-dimensional precision items | 80 |
| MEM19006B | Replace watch batteries | 10 |
| MEM19007B | Perform gemstone setting | 60 |
| MEM19008B | Prepare jewellery designs | 60 |
| MEM19009B | Perform investment procedures for lost wax casting process | 10 |
| MEM19010B | Produce rubber moulds for lost wax casting process | 20 |
| MEM19011B | Perform wax injection of moulds for lost wax casting process | 20 |
| MEM19012B | Produce jewellery wax model | 40 |
| MEM19013B | Produce jewellery metal masters | 40 |
| MEM19014B | Perform hand engraving | 40 |
| MEM19015B | Perform jewellery enamelling | 40 |
| MEM19016B | Construct jewellery components | 40 |
| MEM19017B | Fabricate jewellery items | 60 |
| MEM19018B | Repair jewellery items | 60 |
| MEM19020B | Fault-find and maintain micro-mechanisms | 40 |
| MEM19021B | Diagnose and service micro-mechanisms | 60 |
| MEM19022B | Perform precision micro-mechanism diagnosis and servicing | 60 |
| MEM19023A | Apply drawing and rendering techniques to jewellery or object design | 40 |
| MEM19024A | Use CAD to create and display 3D jewellery and object models | 40 |
| MEM19025A | Create and present designs for jewellery and other 3D objects | 40 |
| MEM19026A | Investigate quality and application of jewellery materials | 20 |
| MEM19027A | Produce life drawings for presenting jewellery and object designs | 60 |
| MEM19028A | Select materials and new technologies for jewellery and 3D object design applications | 40 |
| MEM19029A | Produce a professional jewellery design and 3D object portfolio | 60 |
| MEM19030A | Research and design sustainable objects | 40 |
| MEM19031A | Produce renderings and technical drawings for jewellery and object design construction | 40 |
| MEM19032A | Design and implement mechanisms in jewellery items | 60 |
| MEM19033A | Create silversmithing objects | 60 |
| MEM19034A | Apply chain manufacture process | 40 |
| MEM19035A | Plan and apply casting techniques for jewellery and object designs | 40 |
| MEM19036A | Use specialised techniques to produce jewellery and objects | 80 |
| MEM19037A | Plan and implement chenier fabrication process | 20 |
| MEM19038A | Apply traditional techniques to jewellery and 3D object production | 60 |
| MEM19039A | Plan, conduct and supervise a jewellery and object exhibition | 60 |
| MEM19040A | Create and manufacture jewellery or object design prototypes for the mass market | 60 |
| MEM19041A | Experiment with jewellery or object designs | 60 |
| MEM19042A | Render images using computer graphics software | 60 |
| MEM19043A | Oversee jewellery or object design production | 80 |
| MEM19044A | Repair and restore antique jewellery | 40 |
| MEM19045A | Set gems in channel style settings | 40 |
| MEM19046A | Apply grain setting techniques | 40 |
| MEM19047A | Set gems in claw and bezel style settings | 40 |
| MEM19048A | Develop and apply complex borders and decorations for hand engraving | 60 |
| MEM19049A | Develop and apply heraldic designs for hand engraving | 60 |
| MEM19050A | Hand carve engraving work | 60 |
| MEM19051A | Construct multiple stone settings | 40 |
| MEM19052A | Produce complex objects using silversmithing techniques | 60 |
| MEM19053A | Create complex findings and mechanisms for jewellery items | 60 |
| MEM19054A | Fabricate platinum jewellery items | 40 |
| MEM20001A | Produce keys | 40 |
| MEM20002A | Assemble and test lock mechanisms | 60 |
| MEM20003A | Install and upgrade locks and hardware | 40 |
| MEM20004A | Gain entry | 40 |
| MEM20005A | Install and maintain door control devices/systems | 20 |
| MEM20006A | Maintain and service mechanical locking devices | 60 |
| MEM20007A | Plan and prepare a masterkey system | 60 |
| MEM20008A | Develop and implement a masterkey system | 40 |
| MEM20009A | Gain entry and reinstate fire and security containers | 40 |
| MEM20010A | Gain entry and reinstate automotive locking systems | 40 |
| MEM20011A | Service and repair fire and security containers | 60 |
| MEM20012A | Service and repair mechanical automotive locking systems | 60 |
| MEM20013A | Service automotive transponder systems | 20 |
| MEM20014A | Perform a site security survey | 20 |
| MEM21001A | Replace watch batteries, capacitors and bands  | 20 |
| MEM21002A | Perform watch movement exchange  | 20 |
| MEM21003A | Perform watch case servicing, repair and refurbishment  | 40 |
| MEM21004A | Clean watch and clock components  | 20 |
| MEM21005A | Diagnose faults in quartz watches  | 20 |
| MEM21006A | Service quartz watches  | 40 |
| MEM21007A | Service complex quartz watches  | 40 |
| MEM21008A | Service mechanical watches  | 40 |
| MEM21009A | Inspect, diagnose, adjust and repair mechanical watches  | 40 |
| MEM21010A | Service watch power generating systems  | 20 |
| MEM21011A | Service calendar and other dial indication mechanisms for watches  | 40 |
| MEM21012A | Service and repair mechanical watch oscillating systems  | 40 |
| MEM21013A | Service, test and adjust watch escapements  | 40 |
| MEM21014A | Service mechanical chronograph watches  | 60 |
| MEM21015A | Perform precision watch timing and adjustment  | 60 |
| MEM21016A | Install and set up clocks  | 20 |
| MEM21017A | Service and repair clock timepieces  | 60 |
| MEM21018A | Service clock escapements and oscillating systems  | 40 |
| MEM21019A | Service and repair clock striking mechanisms  | 40 |
| MEM21020A | Service and repair clock chiming mechanisms  | 60 |
| MEM21021A | Restore clockwork mechanisms  | 60 |
| MEM21022A | Manufacture watch and clock components  | 60 |
| MEM21023A | Plan, set up and operate horological workshop or service centre  | 40 |
| MEM22001A | Perform engineering activities | 60 |
| MEM22002A | Manage self in the engineering environment | 40 |
| MEM22007A | Manage environmental effects of engineering activities | 60 |
| MEM22012A | Coordinate resources for an engineering project or operation | 60 |
| MEM22013A | Coordinate engineering projects | 60 |
| MEM22014A | Coordinate engineering-related manufacturing operations | 60 |
| MEM22015A | Source and estimate engineering materials requirements  | 40 |
| MEM22017A | Coordinate continuous improvement and technical development in an engineering-related project or operation | 40 |
| MEM22018A | Coordinate sales and promotion of engineering-related products or services | 60 |
| MEM23003A | Operate and program computers and/or controllers in engineering situations | 80 |
| MEM23004A | Apply technical mathematics | 80 |
| MEM23005A | Apply statistics and probability techniques to engineering tasks | 40 |
| MEM23006A | Apply fluid and thermodynamics principles in engineering | 80 |
| MEM23007A | Apply calculus to engineering tasks | 80 |
| MEM23008A | Apply advanced algebra and numerical methods to engineering tasks | 120 |
| MEM23052A | Apply basic electro and control scientific principles and techniques in aeronautical engineering situations  | 60 |
| MEM23063A | Select and test mechanical engineering materials | 60 |
| MEM23064A | Select and test mechatronic engineering materials | 60 |
| MEM23073A | Select and apply aeronautical engineering methods, processes and construction techniques  | 60 |
| MEM23074A | Select and apply avionic engineering methods, processes and construction techniques  | 60 |
| MEM23084A | Apply scientific principles and techniques in aeronautical engineering situations  | 60 |
| MEM23086A | Apply scientific principles and techniques in avionic engineering situations  | 60 |
| MEM23095A | Apply aeronautical system design principles and techniques in aeronautical engineering situations  | 60 |
| MEM23096A | Apply avionic system design principles and techniques in avionic engineering situations  | 60 |
| MEM23097A | Apply automated systems principles and techniques in aeronautical engineering situations  | 60 |
| MEM23098A | Apply automated systems principles and techniques in avionic engineering situations  | 60 |
| MEM23109A | Apply engineering mechanic principles | 60 |
| MEM23111A | Select electrical equipment and components for engineering applications  | 40 |
| MEM23112A | Investigate electrical and electronic controllers in engineering applications | 40 |
| MEM23113A | Evaluate hydrodynamic systems and system components | 60 |
| MEM23114A | Evaluate thermodynamic systems and components | 60 |
| MEM23115A | Evaluate fluid power systems | 60 |
| MEM23116A | Evaluate programmable logic controller and related control system component applications | 60 |
| MEM23117A | Evaluate microcontrollers applications | 60 |
| MEM23118A | Apply production and service control techniques | 80 |
| MEM23119A | Evaluate continuous improvement processes | 80 |
| MEM23120A | Select mechanical machine and equipment components | 80 |
| MEM23121A | Analyse loads on frames and mechanisms | 80 |
| MEM23122A | Evaluate computer integrated manufacturing systems  | 80 |
| MEM23123A | Evaluate manufacturing processes | 60 |
| MEM23124A | Measure and analyse noise and vibration | 60 |
| MEM23125A | Evaluate maintenance systems | 60 |
| MEM23126A | Evaluate industrial robotic applications | 60 |
| MEM23129A | Evaluate thermal loads in heating, ventilation, air conditioning and refrigeration | 80 |
| MEM23130A | Co-ordinate servicing and fault finding of HVAC/R control systems | 60 |
| MEM23131A | Evaluate rapid prototyping applications | 60 |
| MEM23132A | Evaluate rapid manufacturing processes | 60 |
| MEM23133A | Evaluate rapid tooling applications | 60 |
| MEM23134A | Evaluate jigs and fixtures | 40 |
| MEM23135A | Evaluate moulding tools and processes | 40 |
| MEM23136A | Evaluate stamping and forging tools | 40 |
| MEM23137A | Evaluate rolling tools and processes | 40 |
| MEM23138A | Evaluate suitability of materials for engineering related applications | 40 |
| MEM23139A | Design of a basic single zone duct distribution system  | 40 |
| MEM23140A | Determine operational parameters for building HVAC hydronic systems | 40 |
| MEM23141A | Complete a building thermal performance survey | 80 |
| MEM23142A | Determine psychrometric processes and system performance | 60 |
| MEM23143A | Apply energy management principles | 80 |
| MEM23144A | Contribute to the design of a commercial refrigeration system | 100 |
| MEM23145A | Apply codes and regulations to air conditioning designs | 80 |
| MEM23146A | Contribute to the design of industrial refrigeration systems | 80 |
| MEM23147A | Contribute to the design of hydronic systems | 40 |
| MEM23148A | Develop energy management solutions | 40 |
| MEM23149A | Contribute to the design of commercial and industrial exhaust systems | 40 |
| MEM23150A | Contribute to the design of heating systems | 40 |
| MEM23151A | Commission and optimise performance of HVAC/R systems | 40 |
| MEM23152A | Apply principles of refrigeration food storage technology | 40 |
| MEM23153A | Contribute to the design of heat exchanger systems | 40 |
| MEM23154A | Analyse and service HVAC/R control systems | 80 |
| MEM234001A | Plan and manage engineering-related projects or operations  | 40 |
| MEM234002A | Integrate engineering technologies  | 40 |
| MEM234003A | Design machines and ancillary equipment  | 60 |
| MEM234004A | Design for engineering-related noise and vibration mitigation  | 60 |
| MEM234005A | Design hydrodynamic pumping systems  | 60 |
| MEM234006A | Evaluate and select thermodynamic systems or sub-systems  | 40 |
| MEM234007A | Design fluid power systems  | 40 |
| MEM234008A | Design plant using computer simulations  | 40 |
| MEM234009A | Design computer-integrated manufacturing systems  | 60 |
| MEM234010A | Design microcontroller applications  | 40 |
| MEM234011A | Design programmable logic controller applications  | 60 |
| MEM234012A | Design integrated maintenance management systems  | 60 |
| MEM234013A | Plan and design engineering-related manufacturing processes  | 60 |
| MEM234014A | Design a robotic system  | 40 |
| MEM234015A | Design hydronic heat exchanger systems  | 40 |
| MEM234016A | Design refrigeration systems  | 40 |
| MEM234017A | Design exhaust, ventilation and dust collection systems  | 40 |
| MEM234018A | Design heating, ventilation, air conditioning and refrigeration control systems  | 60 |
| MEM234019A | Apply finite element analysis in engineering design  | 40 |
| MEM234020A | Coordinate small lot manufacture using rapid manufacture processes  | 40 |
| MEM234021A | Apply statistics to technology problems  | 40 |
| MEM234022A | Apply advanced calculus to technology problems  | 40 |
| MEM234023A | Apply differential equations to technology problems  | 40 |
| MEM234024A | Apply advanced mathematics in technology problems  | 40 |
| MEM234025A | Apply numerical methods to technology problems  | 40 |
| MEM234026A | Develop and coordinate engineering-related contingency plans  | 40 |
| MEM234027A | Plan and manage materials supply for an engineering project or manufacturing operation  | 40 |
| MEM234028A | Produce and manage technical documentation  | 40 |
| MEM234029A | Produce and manage technical publications  | 40 |
| MEM234030A | Provide specialised technical and engineering guidance to other technical employees  | 40 |
| MEM234031A | Manage installation, commissioning or modification of machines and equipment  | 60 |
| MEM234032A | Manage fluid power related technologies in an enterprise  | 40 |
| MEM234033A | Lead engineering-related quality operations in an enterprise  | 40 |
| MEM234034A | Manage heating, ventilation, air conditioning and refrigeration systems or projects  | 40 |
| MEM234035A | Maintain and apply technical and engineering skills  | 40 |
| MEM234036A | Apply configuration management procedures in engineering project management | 80 |
| MEM234037A | Perform maintenance-related integrated logistic support management activities | 80 |
| MEM234038A | Apply systems engineering procedures to engineering design project management | 80 |
| MEM24001B | Perform basic penetrant testing | 20 |
| MEM24002B | Perform penetrant testing | 40 |
| MEM24003B | Perform basic magnetic particle testing | 20 |
| MEM24004B | Perform magnetic particle testing | 40 |
| MEM24005B | Perform basic eddy current testing | 20 |
| MEM24006B | Perform eddy current testing | 60 |
| MEM24007B | Perform ultrasonic thickness testing | 20 |
| MEM24008B | Perform ultrasonic testing | 60 |
| MEM24009B | Perform basic radiographic testing | 20 |
| MEM24010B | Perform radiographic testing | 60 |
| MEM24011B | Establish non-destructive tests | 120 |
| MEM24012C | Apply metallurgy principles | 40 |
| MEM25001B | Apply fibre-reinforced materials | 20 |
| MEM25002B | Form and integrate fibre-reinforced structures | 40 |
| MEM25003B | Set up marine vessel structures | 40 |
| MEM25004B | Fair and shape surfaces | 20 |
| MEM25005B | Construct and assemble marine vessel timber components | 80 |
| MEM25006B | Undertake marine sheathing operations | 20 |
| MEM25007B | Maintain marine vessel surfaces | 40 |
| MEM25008B | Repair marine vessel surfaces and structures | 40 |
| MEM25009B | Form timber shapes using hot processes | 20 |
| MEM25010B | Perform fitout procedures | 40 |
| MEM25011B | Install marine systems | 80 |
| MEM25012B | Install and test operations of marine auxiliary systems | 60 |
| MEM25013B | Produce three-dimensional plugs/moulds | 120 |
| MEM25014B | Perform marine slipping operations | 20 |
| MEM25015A | Assemble and install equipment and accessories/ancillaries | 20 |
| MEM26001A | Lay up composites using open moulding techniques | 60 |
| MEM26002A | Lay up composites using vacuum closed moulding techniques | 60 |
| MEM26003A | Lay up composites using pressure closed moulding techniques | 80 |
| MEM26004A | Make basic plugs for composites fabrication | 30 |
| MEM26005A | Make basic moulds for composites fabrications | 30 |
| MEM26006A | Mark and cut out sheets for composite use | 40 |
| MEM26007A | Select and use reinforcing appropriate for product | 40 |
| MEM26008A | Select and use resin systems appropriate for product  | 40 |
| MEM26009A | Select and use cores and fillers appropriate for product  | 20 |
| MEM26010A | Store and handle composite materials  | 20 |
| MEM26011A | Determine materials and techniques for a composite component or product | 60 |
| MEM26012A | Record and trial work processes for one-off composite products  | 60 |
| MEM26013A | Select and use composite processes or systems appropriate for product  | 40 |
| MEM26014A | Adjust resin chemicals for current conditions  | 40 |
| MEM26015A | Select and apply repair techniques  | 60 |
| MEM26016A | Select and use joining techniques  | 60 |
| MEM26017A | Prepare composite or other substrate surfaces  | 40 |
| MEM26018A | Organise composite trials  | 40 |
| MEM26019A | Finish a composite product  | 40 |
| MEM26020A | Identify and interpret required standards for composites  | 20 |
| MEM30005A | Calculate force systems within simple beam structures | 40 |
| MEM30006A | Calculate stresses in simple structures | 40 |
| MEM30007A | Select common engineering materials | 40 |
| MEM30008A | Apply basic economic and ergonomic concepts to evaluate engineering applications | 40 |
| MEM30009A | Contribute to the design of basic mechanical systems | 40 |
| MEM30010A | Set up basic hydraulic circuits | 40 |
| MEM30011A | Set up basic pneumatic circuits | 40 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MEM30013A | Assist in the preparation of a basic workplace layout | 20 |
| MEM30014A | Apply basic just in time systems to the reduction of waste | 40 |
| MEM30015A | Develop recommendations for basic set up time improvements | 20 |
| MEM30016A | Assist in the analysis of a supply chain | 20 |
| MEM30017A | Use basic preventative maintenance techniques and tools | 40 |
| MEM30018A | Undertake basic process planning | 20 |
| MEM30019A | Use resource planning software systems in manufacturing | 40 |
| MEM30020A | Develop and manage a plan for a simple manufacturing related project | 30 |
| MEM30021A | Prepare a simple production schedule | 20 |
| MEM30022A | Undertake supervised procurement activities | 20 |
| MEM30023A | Prepare a simple cost estimate for a manufactured product | 20 |
| MEM30024A | Participate in quality assurance techniques | 30 |
| MEM30025A | Analyse a simple electrical system circuit | 40 |
| MEM30026A | Select and test components for simple electronic switching and timing circuits | 20 |
| MEM30027A | Prepare basic programs for programmable logic controllers | 20 |
| MEM30028A | Assist in sales of technical products/systems | 20 |
| MEM30029A | Use workshop equipment and processes to complete an engineering project  | 60 |
| MEM30031A | Operate computer-aided design (CAD) system to produce basic drawing elements | 40 |
| MEM30032A | Produce basic engineering drawings | 80 |
| MEM30033A | Use computer-operated design (CAD) to create and display 3-D models | 40 |
| MEM50001B | Classify recreational boating technologies and features | 20 |
| MEM50002B | Work safely on marine craft | 10 |
| MEM50003B | Follow work procedures to maintain the marine environment | 10 |
| MEM50004B | Maintain quality of environment by following marina codes | 10 |
| MEM50005B | Refuel vessels | 40 |
| MEM50006B | Check operational capability of marine craft | 40 |
| MEM50007B | Check operational capability of sails and sail operating equipment | 20 |
| MEM50008B | Carry out trip preparation and planning | 40 |
| MEM50009B | Safely operate a mechanically powered recreational boat | 20 |
| MEM50010B | Respond to boating emergencies and incidents | 40 |

SAMPLE TRAINING PROGRAMS

A range of Sample Training Plans have been provided to demonstrate the flexibility of qualifications contained in the **MEM05 Metal and Engineering Training Package**, but are by no means mandatory.

|  |  |
| --- | --- |
| Occupation /Work Function | Assistant Operator |
| Qualification Title  | Certificate I in Engineering |
| Qualification Code | MEM10105 |
| Description | Appropriate for a person working in the fabrication sector of the industry. |
| Notes | For advice on how to choose electives others than those listed below, please refer to the **Metals and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| Unit Code | Unit Title | Unit Code |
| **Core** |   | **Core** |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| **Electives** |   |   |
| MEM03001B | Perform manual production assembly | 40 |
| MEM03003B | Perform sheet and plate assembly | 40 |
| MEM07001B | Perform operational maintenance of machines/equipment | 20 |
| MEM07024B | Operate and monitor machine/process | 40 |
| MEM13003B | Work safely with industrial chemicals and materials | 20 |
| MEM16005A | Operate as a team member to conduct manufacturing, engineering or related activities | 20 |
| MEM16006A | Organise and communicate information | 20 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools / hand held operations | 20 |
|  | **Total** | **280** |

|  |  |
| --- | --- |
| Occupation /Work Function | Boat Operator Assistant |
| **Qualification Title**  | Certificate I in Boating Services |
| **Qualification Code** | MEM10205 |
| **Description** | Appropriate for a person working as an operator assistant in the boating industry. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metals and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM50001B | Classify recreational boating technologies and features | 20 |
| MEM50002B | Work safely on marine craft | 10 |
| MEM50003B | Follow work procedures to maintain the marine environment | 10 |
| **Electives** |   |   |
| MEM50005B | Refuel vessels | 40 |
| MEM50006B | Check operational capability of marine craft | 40 |
| MEM50010B | Respond to boating emergencies and incidents | 40 |
|   | **Total** | **200** |

|  |  |
| --- | --- |
| Occupation /Work Function | Production Operator |
| **Qualification Title**  | Certificate II in Engineering  |
| **Qualification Code** | MEM20105 |
| **Description** | Appropriate for a person working as a production operator in the automotive component industry. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metals and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| **Electives** |   |  |
| MEM07003B | Perform machine setting (routine) | 40 |
| MEM07015B | Set computer controlled machines/processes | 20 |
| MEM07024B | Operate and monitor machine/process | 40 |
| MEM07028B | Operate computer controlled machines/processes | 20 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM16006A | Organise and communicate information | 20 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
|   | **Total** | **340** |

|  |  |
| --- | --- |
| Occupation /Work Function | Boating Operator |
| **Qualification Title**  | Certificate II in Boating Services |
| **Qualification Code** | MEM20305 |
| **Description** | Appropriate for a person working as a boating operator. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metals and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03)9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM50001B | Classify recreational boating technologies and features | 20 |
| MEM50002B | Work safely on marine craft | 10 |
| MEM50003B | Follow work procedures to maintain the marine environment | 10 |
| **Electives** |   |   |
| MEM11010B | Operate mobile load shifting equipment | 40 |
| MEM50010B | Respond to boating emergencies and incidents | 40 |
| MEM25007B | Maintain marine vessel surfaces | 40 |
| MEM50005B | Refuel vessels | 40 |
| MEM50006B | Check operational capability of marine craft | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
|   | **Total** | **330** |

|  |  |
| --- | --- |
| Occupation /Work Function | Production Operator/Leading Hand |
| **Qualification Title**  | Certificate III in Engineering — Production Systems |
| **Qualification Code** | MEM30105 |
| **Description** | Appropriate for a person working as an operator/leading hand in engineering production. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metals and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Production stream units** |  |
| MEM03001B | Perform manual production assembly | 40 |
| MEM03002B | Perform precision assembly | 40 |
| MEM03003B | Perform sheet and plate assembly | 40 |
| MEM03006B | Set assembly stations | 20 |
| MEM07001B | Perform operational maintenance of machines/equipment | 20 |
| MEM07003B | Perform machine setting (routine) | 40 |
| MEM07004B | Perform machine setting (complex) | 80 |
| MEM07024B | Operate and monitor machine/process | 40 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |

|  |  |  |
| --- | --- | --- |
| **MEM30105** | **Certificate III in Engineering — Production Systems (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
|   |  Specialisation units |   |
| MEM07005C | Perform general machining | 80 |
| MEM07006C | Perform lathe operations | 40 |
| MEM07028B | Operate computer controlled machine/processes | 20 |
| MEM07029B | Perform routine sharpening/maintenance of production tools and cutters | 40 |
| MEM07015B | Set computer controlled machines/processes | 20 |
| MEM07016C | Set and edit computer controlled machines/processes | 40 |
| MEM07018C | Write basic NC/CNC programs | 40 |
| MEM12003B | Perform precision mechanical measurement | 20 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM13003B | Work safely with industrial chemicals and materials | 20 |
|   | **Total** | **960** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Trades Person (Mechanical) |
| **Qualification Title**  | Certificate III in Engineering — Mechanical Trade |
| **Qualification Code** | MEM30205  |
| **Description** | Appropriate for a person working as a mechanical engineering trades person. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Mechanical stream units** |   |
| MEM07005C | Perform general machining | 80 |
| MEM07006C | Perform lathe operations | 40 |
| MEM07007C | Perform milling operations | 40 |
| MEM07008C | Perform grinding operations | 40 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM12003B | Perform precision mechanical measurement | 20 |
| MEM12006C | Mark off/out (general engineering) | 40 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
| MEM18003C | Use tools for precision work | 40 |
| MEM18004B | Maintain and overhaul mechanical equipment | 40 |
| MEM18005B | Perform fault diagnosis, installation and removal of bearings | 40 |
| MEM18006C | Repair and fit engineering components | 60 |
| MEM18007B | Maintain and repair mechanical drives and mechanical transmission assemblies | 40 |

|  |  |  |
| --- | --- | --- |
| **MEM30205** | **Certificate III in Engineering — Mechanical Trade (continued)** |  |
| Occupation /Work Function | **Unit Title** | **Hours** |
| MEM18009B | Perform levelling and alignment of machines and engineering components | 40 |
| MEM18010C | Perform equipment condition monitoring and recording | 40 |
| MEM18055B | Dismantle, replace and assemble engineering components | 30 |
|   | **Specialisation units** |   |
| MEM11011B | Undertake manual handling | 20 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM13002B | Undertake occupational health and safety activities in the workplace | 30 |
|   | **Total** | **960** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Trades Person (Fabrication) |
| **Qualification Title**  | Certificate III in Engineering — Fabrication Trade |
| **Qualification Code** | MEM30305 |
| **Description** | Appropriate for a person working as a fabrication engineering trades person. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03)9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Fabrication stream units** |   |
| MEM05005B | Carry out mechanical cutting | 20 |
| MEM05007C | Perform manual heating and thermal cutting | 20 |
| MEM05008C | Perform advanced manual thermal cutting, gouging and shaping | 20 |
| MEM05010C | Apply fabrication, forming and shaping techniques | 80 |
| MEM05011D | Assemble fabricated components | 80 |
| MEM05012C | Perform routine manual metal arc welding | 20 |
| MEM05013C | Perform manual production welding | 20 |
| MEM05014C | Monitor quality of production welding/fabrications | 20 |
| MEM05015D | Weld using manual metal arc welding process | 40 |
| MEM05017D | Weld using gas metal arc welding process | 40 |
| MEM05019D | Weld using gas tungsten arc welding process | 40 |
| MEM05026C | Apply welding principles | 40 |
| MEM05037C | Perform geometric development | 60 |
| MEM05047B | Weld using flux core arc welding process | 40 |
| MEM05049B | Perform routine gas tungsten arc welding | 20 |
| MEM05050B | Perform routine gas metal arc welding | 20 |

|  |  |  |
| --- | --- | --- |
| **MEM30305** | **Certificate III in Engineering — Fabrication Trade (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| MEM05051A | Select welding processes | 20 |
| MEM05052A | Apply safe welding practices | 40 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
|   | **Total** | **960** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Assistant Technician  |
| **Qualification Title**  | Certificate III in Engineering — Technical |
| **Qualification Code** | MEM30505 |
| **Description** | Suitable for a person working as an Engineering Assistant Technician.  |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** |   |   |
| MEM09002B | Interpret technical drawing | 40 |
| MEM30031A | Operate computer-aided design (CAD) system to produce basic drawing elements | 40 |
| MEM30032A | Produce basic engineering drawings | 80 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MEM30006A | Calculate stresses in simple structures | 40 |
| MEM30019A | Use resource planning software systems in manufacturing | 40 |
| MEM30020A | Develop and manage a plan for a simple manufacturing related project | 30 |
|   | **Total** | **380** |

|  |  |
| --- | --- |
| Occupation /Work Function | Marine Craft Construction and Maintenance Trades Person |
| **Qualification Title**  | Certificate III in Marine Craft Construction |
| **Qualification Code** | MEM30705 |
| **Description** | Appropriate for a person working as marine craft construction and maintenance trades person. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03)9286 9880. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** |   |   |
| MEM04018B | Perform general woodworking machine operations | 40 |
| MEM08014B | Apply protective coatings (basic) | 40 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM09021B | Interpret and produce curved 3-dimensional shapes | 40 |
| MEM12007D | Mark off/out structural fabrications and shapes | 40 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM13003B | Work safely with industrial chemicals and materials | 20 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
| MEM25001B | Apply fibre-reinforced materials | 20 |
| MEM25002B | Form and integrate fibre-reinforced structures | 40 |
| MEM25003B | Set up marine vessel structures | 40 |
| MEM25004B | Fair and shape surfaces | 20 |
| MEM25005B | Construct and assemble marine vessel timber components | 80 |
| MEM25007B | Maintain marine vessel surfaces | 40 |
| MEM25008B | Repair marine vessel surfaces and structures | 40 |

|  |  |  |
| --- | --- | --- |
| **MEM30705** | **Certificate III in Engineering — Marine Craft Construction (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| MEM25009B | Form timber shapes using hot processes | 20 |
| MEM25013B | Produce three-dimensional plugs/moulds | 120 |
| MEM25014B | Perform marine slipping operations | 20 |
| MEM25015A | Assemble and install equipment and accessories/ancillaries | 20 |
|   | **Total** | **960** |

|  |  |
| --- | --- |
| **Occupation** | Composites worker. |
| **Qualification Title**  | Certificate III in Engineering - Composites Trade |
| **Qualification Code** | MEM31112 |
| **Description** | Appropriate for a person working with composites within the metal, engineering, manufacturing and associated industries |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03)9286 9934 |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives Group A**  |
| MEM26001A | Lay up composites using open moulding techniques | 60 |
| MEM26002A | Lay up composites using vacuum closed moulding techniques | 60 |
| **Electives Group B** |
| MEM26004A | Make basic plugs for composites fabrication | 30 |
| MEM26005A | Make basic moulds for composites fabrications | 30 |
| MEM26006A | Mark and cut out sheets for composite use | 40 |
| MEM26007A | Select and use reinforcing appropriate for product | 40 |
| MEM26008A | Select and use resin systems appropriate for product | 40 |
| MEM26009A | Select and use cores and fillers appropriate for product | 20 |
| MEM26010A | Store and handle composite materials | 20 |
| MEM26012A | Record and trial work processes for one-off composite products | 40 |
| MEM26013A | Select and use composite processes or systems appropriate for product | 40 |
| **MEM31112** | **Certificate III in Engineering - Composites Trade (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| **Electives Group C - Specialisation units** |
| MEM09002B | Interpret technical drawing | 40 |
| MEM26011A | Determine materials and techniques for a composite component or product\*  | 60 |
| MEM26014A | Adjust resin chemicals for current conditions  | 40 |
| MEM26015A | Select and apply repair techniques  | 60 |
| MEM26016A | Select and use joining techniques  | 60 |
| MEM26017A | Prepare composite or other substrate surfaces  | 40 |
| MEM26019A | Finish a composite product  | 40 |
|   | **Total** | **990** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Trades Person |
| Qualification Title  | Certificate IV in Engineering |
| Qualification Code | MEM40105 |
| Description | Appropriate for a person working as an engineering trades person with additional specialist skills. |
| Notes | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05**) and it’s Qualifications Packaging Rules or contact the CMM Engineering Industries on (03)9286 9934. |
| Unit Code | Unit Title | Hours |
| **Core** |   |   |
| MEM12023A | Perform engineering measurements | 30 |
| MEM12024A | Perform computations | 30 |
| MEM13014A | Apply principles of occupational health and safety in the work environment | 10 |
| MEM14004A | Plan to undertake a routine task | 10 |
| MEM14005A | Plan a complete activity | 20 |
| MEM15002A | Apply quality systems | 20 |
| MEM15024A | Apply quality procedures | 10 |
| MEM16006A | Organise and communicate information | 20 |
| MEM16007A | Work with others in a manufacturing, engineering or related environment | 10 |
| MEM16008A | Interact with computing technology | 20 |
| MEM17003A | Assist in the provision of on the job training | 20 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Group A Specialisation units**  |   |
| MEM07016C | Set and edit computer controlled machines/processes | 40 |
| MEM07018C | Write basic NC/CNC programs | 40 |
| MEM07019C | Program NC/CNC machining centre | 20 |
| MEM07020C | Program multiple spindle and/or multiple axis NC/CNC machining centre | 20 |
| MEM07023C | Program and set up CNC manufacturing cell | 60 |
| MEM12003B | Perform precision mechanical measurement | 20 |
|   | **Group B Specialisation units**  |   |
| MEM07001B | Perform operational maintenance of machines/equipment | 20 |
| MEM07003B | Perform machine setting (routine) | 40 |
| MEM07004B | Perform machine setting (complex) | 80 |
| MEM07005C | Perform general machining | 80 |
| MEM07006C | Perform lathe operations | 40 |
| MEM07007C | Perform milling operations | 40 |

|  |  |  |
| --- | --- | --- |
| **MEM40105** | **Certificate IV in Engineering (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| MEM07008D | Perform grinding operations | 40 |
| MEM07011B | Perform complex milling operations | 40 |
| MEM07012B | Perform complex grinding operations | 40 |
| MEM07013B | Perform machining operations using horizontal and/or vertical boring machines | 40 |
| MEM07015B | Set computer controlled machines/processes | 20 |
| MEM07024B | Operate and monitor machine/process | 40 |
| MEM07025B | Perform advanced machine/process operation | 60 |
| MEM07026B | Perform advanced plastic processing | 60 |
| MEM07027B | Perform advanced press operations | 60 |
| MEM07028B | Operate computer controlled machine/processes | 20 |
| MEM09002B | Interpret technical drawing | 40 |
| MEM09022A | Create 2D code files using computer aided manufacture system | 40 |
| MEM10004B | Enter and change programmable controller operational parameters | 20 |
| MEM13001B | Perform emergency first aid | 10 |
| MEM13003B | Work safely with industrial chemicals and materials | 20 |
| MEM18001C | Use hand tools | 20 |
| MEM18002B | Use power tools/hand held operations | 20 |
|   | **Total** | **1320** |

|  |  |
| --- | --- |
| **Occupation** | Engineering Draftsman |
| **Qualification Title**  | Certificate IV in Engineering Drafting |
| **Qualification Code** | MEM40412 |
| **Description** | Appropriate for a person working as a detail draftsperson producing specialist engineering drawings within an engineering or manufacturing work environment. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934 |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives**  |  |   |
| MEM09002B | Interpret technical drawing | 40 |
| MEM09202A | Produce freehand sketches | 40 |
| MEM09204A | Produce engineering detail drawings  | 80 |
| MEM09208A | Detail fasteners and locking devices in mechanical drawings | 40 |
| MEM09209A | Detail bearings, seals and other componentry in mechanical drawings | 40 |
| MEM09210A | Create 3-D solid models using computer aided design system | 80 |
| MEM09220A | Apply surface modelling techniques to 3-D drawings | 80 |
| MEM09221A | Create 3-D model assemblies using computer aided design system | 80 |
| MEM30031A | Operate computer-aided design (CAD) system to produce basic drawing elements | 40 |
| MEM30032A | Produce basic engineering drawings | 80 |
| MEM30033A | Use computer-operated design (CAD) to create and display 3-D models | 40 |
|   | **Total** | **750** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Technician |
| **Qualification Title**  | Diploma of Engineering — Technical |
| **Qualification Code** | MEM50212 |
| **Description** | Appropriate for a person working as an engineering technician in engineering manufacturing. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MEM30007A | Select common engineering materials | 40 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Group A** |   |
| MEM09002B | Interpret technical drawing | 40 |
| MEM12024A | Perform computations | 30 |
| MEM30031A | Operate computer-aided design (CAD) system to produce basic drawing elements | 40 |
| MEM30032A | Produce basic engineering drawings | 80 |
| MEM30033A | Use computer-operated design (CAD) to create and display 3-D models | 40 |
| MEM30009A | Contribute to the design of basic mechanical systems | 40 |
| MEM30008A | Apply basic economic and ergonomic concepts to evaluate engineering applications | 40 |
| **Electives** | **Group B** |   |
| MEM09157A | Perform mechanical engineering design drafting | 80 |
| MEM12025A | Use graphical techniques and perform simple statistical computations | 20 |
| MEM14089A | Integrate mechanical fundamentals into an engineering task | 60 |
| MEM22002A | Manage self in the engineering environment | 40 |
| MEM23003A | Operate and program computers and/or controllers in engineering situations | 80 |
| MEM23109A | Apply engineering mechanic principles | 60 |
| MEM23112A | Investigate electrical and electronic controllers in engineering applications | 40 |
| MEM23063A | Select and test mechanical engineering materials | 60 |
|   | **Total** | **900** |

|  |  |
| --- | --- |
| **Occupation** | Avionics Technician |
| **Qualification Title**  | Diploma of Engineering – Technical |
| **Qualification Code** | MEM50212 |
| **Description** | Appropriate for a person working as an avionics technician in aerospace maintenance |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the Metal and Engineering Training Package (MEM05) and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |  |  |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MEM30007A | Select common engineering materials | 40 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives**  |  **Group A** |  |
| MEA101B | Interpret occupational health and safety practices in aviation maintenance | 40 |
| MEA105C | Apply quality standards applicable to aviation maintenance processes | 20 |
| MEA107B | Interpret and use aviation maintenance industry manuals and specifications | 20 |
| MEA108B | Complete aviation maintenance industry documentation | 20 |
| MEA109B | Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance | 80 |
| MEA270A | Lay out avionic systems | 120 |
| MEA271A | Lay out avionic flight management systems | 120 |
| MEM30032A | Produce basic engineering drawings | 80 |
|  |  **Group B** |   |
| MEA272B | Apply basic scientific principles and techniques in avionic engineering situations | 80 |
| MEA273A | Select and test avionic engineering materials | 60 |
| MEM09144A |  Represent avionic engineering designs  | 80 |
| MEM14084A | Apply avionic engineering fundamentals to support design and development of engineering projects  | 60 |
| MEM23074A | Select and apply avionic engineering methods, processes and construction techniques  | 60 |
| MEA340A | Lay out and set up aircraft systems | 120 |
| MEA341A | Apply basic aircraft design characteristics | 120 |
|   | **Total** | **1230** |

|  |  |
| --- | --- |
| Occupation /Work Function | Engineering Technical Officer |
| **Qualification Title**  | Advanced Diploma of Engineering |
| **Qualification Code** | MEM60112 |
| **Description** | Appropriate for a person working as an engineering technician in engineering manufacturing. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the **Metal and Engineering Training Package (MEM05)** and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934. |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MEM22001A | Perform engineering activities | 60 |
| MEM22002A | Manage self in the engineering environment | 40 |
| MEM30007A | Select common engineering materials | 40 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives** | **Group A** |   |
| MEM30005A | Calculate force systems within simple beam structures | 40 |
| MEM30006A | Calculate stresses in simple structures | 40 |
| MEM30009A | Contribute to the design of basic mechanical systems | 40 |
| MEM30031A | Operate computer-aided design (CAD) system to produce basic drawing elements | 40 |
| MEM30032A | Produce basic engineering drawings | 80 |
| MEM30033A | Use computer-operated design (CAD) to create and display 3-D models | 40 |
| MEM12024A | Perform computations | 30 |
| **Electives** | **Group B** |   |
| MEM09157A | Perform mechanical engineering design drafting | 80 |
| MEM12025A | Use graphical techniques and perform simple statistical computations | 20 |
| MEM14089A | Integrate mechanical fundamentals into an engineering task | 60 |
| MEM14090A | Integrate mechatronic fundamentals into an engineering task | 40 |
| MEM15001B | Perform basic statistical quality control | 20 |
| MEM22007A | Manage environmental effects of engineering activities | 60 |
| MEM22013A | Coordinate engineering projects | 60 |
| MEM22014A | Coordinate engineering-related manufacturing operations | 60 |
| MEM22017A | Coordinate continuous improvement and technical development in an engineering-related project or operation | 40 |
| **MEM60112** | **Advanced Diploma of Engineering (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| MEM23007A | Apply calculus to engineering tasks | 80 |
| MEM23109A | Apply engineering mechanic principles | 60 |
| MEM23111A | Select electrical equipment and components for engineering applications  | 40 |
| MEM23063A | Select and test mechanical engineering materials | 60 |
| MEM23118A | Apply production and service control techniques | 60 |
| MEM23122A | Evaluate computer integrated manufacturing systems  | 60 |
| MSACMT670A | Develop and manage sustainable energy practices | 70 |
|   | **Total** | **1430** |

|  |  |
| --- | --- |
| **Occupation** | Aeronautical Technical Officer |
| **Qualification Title**  | Advanced Diploma of Engineering |
| **Qualification Code** | MEM60112 |
| **Description** | Appropriate for a person working as an aeronautical technician in aerospace maintenance |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the Metal and Engineering Training Package (MEM05) and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934 |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM16006A | Organise and communicate information | 20 |
| MEM16008A | Interact with computing technology | 20 |
| MEM22001A | Perform engineering activities | 60 |
| MEM22002A | Manage self in the engineering environment | 40 |
| MEM30007A | Select common engineering materials | 40 |
| MEM30012A | Apply mathematical techniques in a manufacturing engineering or related environment | 40 |
| MSAENV272B | Participate in environmentally sustainable work practices | 30 |
| **Electives A** |   |   |
| MEA101B | Interpret occupational health and safety practices in aviation maintenance | 40 |
| MEA105C | Apply quality standards applicable to aviation maintenance processes | 20 |
| MEA107B | Interpret and use aviation maintenance industry manuals and specifications | 20 |
| MEA108B | Complete aviation maintenance industry documentation | 20 |
| MEA109B | Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance | 80 |
| MEA340A | Lay out and set up aircraft systems | 120 |
| MEA341A | Apply basic aircraft design characteristics | 120 |
| MEM30032A | Produce basic engineering drawings | 80 |
| **Electives B** |   |   |
| MEA342A | Apply basic aircraft power plant design characteristics | 120 |
| MEA349B | Apply basic scientific principles and techniques in aeronautical engineering situations | 120 |
| MEA350A | Select and test aeronautical engineering materials | 80 |
| MEM09143A |  Represent aeronautical engineering designs  | 80 |
| MEM09153A |  Apply computer-aided modelling and data management techniques to aeronautical engineering designs  | 80 |

|  |  |  |
| --- | --- | --- |
| **MEM60112** | **Advanced Diploma of Engineering (continued)** |  |
| **Unit Code** | **Unit Title** | **Hours** |
| MEM14065A | Plan and design aeronautical engineering projects  | 60 |
| MEM14083A | Apply aeronautical engineering fundamentals to support design and development of engineering projects  | 60 |
| MEM23052A | Apply basic electro and control scientific principles and techniques in aeronautical engineering situations  | 60 |
| MEM23073A | Select and apply aeronautical engineering methods, processes and construction techniques  | 60 |
| MEM23084A | Apply scientific principles and techniques in aeronautical engineering situations  | 60 |
| MEM23095A | Apply aeronautical system design principles and techniques in aeronautical engineering situations  | 60 |
| MEM23097A | Apply automated systems principles and techniques in aeronautical engineering situations  | 60 |
| MEM23004A | Apply technical mathematics | 80 |
| MEM23007A | Apply calculus to engineering tasks | 80 |
| MEM23003A | Operate and program computers and/or controllers in engineering situations | 80 |
|   | **Total** | **1890** |

|  |  |
| --- | --- |
| **Occupation** | Project Manager |
| **Qualification Title**  | Vocational Graduate Diploma of Engineering |
| **Qualification Code** | MEM80112 |
| **Description** | Appropriate for a person working in a Project Management role. |
| **Notes** | For advice on how to choose electives others than those listed below, please refer to the Metal and Engineering Training Package (MEM05) and its Qualifications Packaging Rules or contact the CMM Engineering Industries on (03) 9286 9934 |
| **Unit Code** | **Unit Title** | **Hours** |
| **Core** |   |   |
| MEM234002A | Integrate engineering technologies  | 40 |
| MEM234035A | Maintain and apply technical and engineering skills  | 40 |
| MSAENV672B | Develop workplace policy and procedures for environmental sustainability | 50 |
| **Electives A** |   |   |
| MEM234003A | Design machines and ancillary equipment  | 60 |
| MEM234009A | Design computer-integrated manufacturing systems  | 60 |
| MEM234013A | Plan and design engineering-related manufacturing processes  | 60 |
| MSACMG712A | Lead a problem solving process to determine and solve root cause  | 80 |
| **Electives B** |   |   |
| MSACMG702A | Review manufacturing practice tools and techniques  | 80 |
| MSACMG706A | Build relationships between teams in a manufacturing environment  | 80 |
| MSACMT622A | Design a process layout  | 80 |
|   | **Total** | **630** |

CONTACTS AND LINKS

|  |
| --- |
| **Industry Skills Council (ISC)** |
| Manufacturing Skills Australia Industry Skills Council | This ISC is responsible for developing this **MEM05 Metal and** **Engineering** **Training Package** and can be contacted for further information. You can also source copies of the Training Package and support material. | Level 8, 80 Arthur Street North Sydney NSW 2060Postal Address: PO Box 289  North Sydney NSW 2059Phone: 1800 242 830Email: info@mskills.com.auWeb: [Manufacturing Skills Australia](http://www.mskills.com.au/) |
| **National Register for VET in Australia** |
| Training.gov.au (TGA) | TGA is the Australian governments’ official National Register of information on Training Packages, qualifications, courses, units of competency and RTOs. | training.gov.au  |
| **Australian Government** |
| The Department of Industry, Innovation, Science, Research and Tertiary Education(DIISRTE) | DIISRTE provides a range of services and resources to assist in delivery of Training Packages. Search the DIISRTE website for links to a range of relevant resources and publications. | <http://www.innovation.gov.au>You may also find Department of Education Employment and Workplace Relations website of use.<http://www.deewr.gov.au> |
| **State Government** |
| Skills Victoria | Skills Victoria is responsible for funding and the implementation of Vocational Education and Training (VET) in Victoria, including Apprenticeships and Traineeships. | [www.skills.vic.gov.au](http://www.skills.vic.gov.au) |
| **Curriculum Maintenance Manager (CMM)** |
| Engineering Industries | The CMM service is provided by Executive Officers located within Victorian TAFE institutes on behalf of Skills Victoria. | Dennis Crowley Box Hill Institute of TAFE, Private Bag 2014, Box Hill, Victoria, 3128Phone: (03) 9286 9934Fax: (03) 9286 9838Email: D.Crowley@bhtafe.edu.auWeb: <http://trainingsupport.skills.vic.gov.au/cmminf.cfm> |
| **State VET Regulatory Authority** |
| Victorian Registration and Qualifications Authority (VRQA) | The VRQA is a statutory authority responsible for the registration of education and training providers in Victoria to ensure the delivery of quality education and training. | [www.vrqa.vic.gov.au](http://www.vrqa.vic.gov.au)Phone: 03 9637 2806 |
| **National VET Regulatory Authority** |
| Australian Skills Quality Authority (ASQA) | ASQA is the national regulator for Australia’s VET sector vocational education and training sector. ASQA regulates courses and training providers to ensure nationally approved quality standards are met. | [www.asqa.gov.au](http://www.asqa.gov.au)Info line: 1300 701 801 |
| **WorkSafe**  |
| WorkSafe Victoria | WorkSafe needs to provide written verification before High Risk Work Units can be added to an RTO’s scope of registration. | [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au) Info line: 1800 136 089 |

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. |
| **Nominal Hours** | The anticipated hours of supervised learning or training deemed necessary to conduct training and assessment activities associated with the program of study. These hours are determined by the Victorian State Training Authority. Nominal hours may vary for a qualification depending on the units of competency selected.  |
| **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. |