

MEM05 METALS AND ENGINEERING TRAINING PACKAGE

Version 11.1

WA NOMINAL HOURS GUIDE

**Western Australian Department of Training and
Workforce Development**

Updated July 2015

Introduction

This WA Nominal Hours Guide has been generated to enable the stakeholders in the metals and engineering industry in Western Australia to participate in the managed implementation of **Version 11** the National MEM05 Metals and Engineering Training Package.

This Guide is designed to aid Registered Training Organisations (RTOs) to convert from existing Training Package qualifications to new Training Package qualifications within the scope of their training delivery.

The Guide should be read in conjunction with the **endorsed components** of the Training Package

Version 11.1 of the MEM05 Metals and Engineering Training Package was released on Training.Gov.Au (TGA) on the **5 June 2014**.

Version 11 of the MEM05 Metals and Engineering Training Package was released on Training.Gov.Au (TGA) on the **15 December 2013**.

Transition Arrangements

Registered Training Organisations (RTOs) are required to deliver Training Package qualifications within 12 months of the release date of the Training Package on to Training.gov.au (TGA).

Students currently enrolled in an existing version of the Training Package qualification should be permitted to complete the program they enrolled in initially, unless the move to the related qualification from a Training Package can be made without disadvantage to a student.

Nominal Hours

The Commonwealth Department of Employment, Education and Workplace Relations' definition of nominal hours states:

“The value assigned to a structured program of study that nominally represents the anticipated hours of supervised learning and/or training deemed necessary to conduct training/learning and assessment activities associated with the program of study”

Source: National Quality Council Training Package Glossary Version V2.1 17/03/2010

<http://www.deewr.gov.au/Skills/Overview/Policy/TPDH/Downloads/Documents/TrainingPackGlossary.pdf>

Nominal hours are identified for each Training Package qualification. Total nominal hours may vary within a qualification depending on the units of competency

In Western Australia, nominal hours are used as a mechanism for funding allocation.

Contact Details

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Licensing Requirements

Specific licenses may be required in some jobs. The local regulations should be checked for details. The industry is generally subject to a range of regulatory control.

These vary with the nature of the work and to some extent on its location as most regulations are State based and some are enforced by local government. This Training Package allows for these differences without mandating them to specific units of competency which would not be appropriate.

Selected units of competency and qualifications in this Training Package have been designed to satisfy or partly satisfy the licensing requirements of various industry sectors.

This Metal and Engineering Training Package publication provides advisory information based on discussions with representatives of industry and regulators. All possible care has been taken in the preparation of this material, however, persons should not rely solely on this publication on matters involving industry specific current or proposed licensing requirements or arrangements.

Packaging of High Risk Licensing Units

High Risk Licensing Unit	Pts	Packaging Information
TLILIC2001A Licence to operate a forklift truck	0	This unit has been allocated no points and imported as an elective to: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM20305 Certificate II in Boating Services MEM30905 Certificate III in Boating Services MEM30105 Certificate III in Engineering – Production Systems MM40105 Certificate IV in Engineering MEM50105 Diploma of Engineering – Advanced Trade The unit is also included in the list of Certificate III trade specialisation units.
TLILIC2002A Licence to operate an order picking forklift truck	0	This unit has been allocated no points and imported as an elective to: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
TLILIC3003A Licence to operate a bridge and gantry crane	0	A new MEM unit has been developed and allocated 4 points to provide MEM required work outcomes for use in conjunction with the licensing unit – MEM11023A Operate a bridge and gantry crane. TLILIC3003A has been imported and allocated no points. MEM11023A and TLILIC3003A have been included as electives in: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
TLILIC0012A Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)	1	Unit has been allocated 1 point and imported as an elective to the following qualifications: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM20305 Certificate II in Boating Services MEM30905 Certificate III in Boating Services MEM30105 Certificate III in Engineering – Production Systems MEM40105 Certificate IV in Engineering MEM50105 Diploma of Engineering – Advanced Trade

High Risk Licensing Unit	Pts	Packaging Information
		The unit has also been included in the list of Certificate III trade specialisation units.
CPCCLDG3001A - Licence to perform dogging	0	This unit has been allocated no points and imported as an elective to: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
CPCCLRG3001A - Licence to perform rigging basic level	0	A new MEM unit has been developed and allocated 4 points to provide MEM required work outcomes for use in conjunction with the licensing unit – MEM11024A Undertake basic rigging. CPCCLRG3001A has been imported and allocated no points. MEM11024A and CPCCLRG3001A have been included as electives in: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
CPCCLSF2001A - Licence to erect, alter and dismantle scaffolding basic level	0	This unit has been allocated no points and imported as an elective to: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
CPCCLSF3001A - Licence to erect, alter and dismantle scaffolding intermediate level	0	This unit has been allocated no points and imported as an elective to: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems
TLILIC3006A Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)	0	A new MEM unit has been developed and allocated 4 points to provide MEM required work outcomes for use in conjunction with the licensing unit – MEM11025A Operate a non-slewing mobile crane of greater than 3 tonnes capacity. TLILIC3006A has been imported and allocated no points. MEM11025A and TLILIC3006A have been included as electives in: <ul style="list-style-type: none"> MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production System

Version Modification History

The version details of this endorsed Training Package are in the table below. The latest information is at the top of the table.

Version	TGA Release Date	Modification History																								
11.1	5 June 2014	<p>ISC Upgrade</p> <ul style="list-style-type: none"> Data correction to replace missing text in MEM234001A. Correction of typographical error in MEM50212. <p>Refer to summary mapping for details.</p>																								
11	15 December 2014	<p>Addition of</p> <ul style="list-style-type: none"> one (1) new qualification <ul style="list-style-type: none"> MEM20413 Certificate II in Engineering Pathways seven (7) new pathways units of competency. <ul style="list-style-type: none"> MEMPE001A Use engineering workshop machines MEMPE002A Use electric welding machines MEMPE003A Use oxy-acetylene and soldering equipment MEMPE004A Use fabrication equipment MEMPE005A Develop a career plan for the engineering and manufacturing industry MEMPE006A Undertake a basic engineering project MEMPE007A Pull apart and re-assemble engineering mechanisms <p>ISC Upgrade</p> <p>ISC correction to MEM60112</p> <ul style="list-style-type: none"> Release 2 - Code correction in Avionic stream to updated unit MEM23086A 																								
10.1	15 September 2013	<p>ISC Upgrade</p> <p>ISC correction of TGA error - Release 2 of MEM07004B, replacing release 1 (refer to version 9 history within the Training Package)</p> <p>Imported elective units of competency updated to current versions.</p> <table border="1"> <thead> <tr> <th>MEM05v10</th> <th>MEM05v10.1</th> <th>Qualifications affected</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>AURV225908A</td> <td>AURVTN2002 Carry out panel repairs</td> <td>MEM30105 MEM40105 MEM50105</td> <td>No change in outcomes</td> </tr> <tr> <td>BSBPMG510A</td> <td>BSBPMG522A Undertake project work</td> <td>MEM50311 MEM60211</td> <td>No change in outcomes</td> </tr> <tr> <td>BSBSMB405A</td> <td>BSBSMB405B Monitor and manage small business operations</td> <td>MEM40311 MEM50311 MEM60211</td> <td>No change in outcomes</td> </tr> <tr> <td>SIRXSLS001A</td> <td>SIRXSL201 Sell products and services</td> <td>MEM50311 MEM60211</td> <td>No change in outcomes</td> </tr> <tr> <td>UEPMNT419A</td> <td>UEPMNT419B Perform civil drafting</td> <td>MEM40412 MEM50212</td> <td>No change in outcomes</td> </tr> </tbody> </table>	MEM05v10	MEM05v10.1	Qualifications affected	Comment	AURV225908A	AURVTN2002 Carry out panel repairs	MEM30105 MEM40105 MEM50105	No change in outcomes	BSBPMG510A	BSBPMG522A Undertake project work	MEM50311 MEM60211	No change in outcomes	BSBSMB405A	BSBSMB405B Monitor and manage small business operations	MEM40311 MEM50311 MEM60211	No change in outcomes	SIRXSLS001A	SIRXSL201 Sell products and services	MEM50311 MEM60211	No change in outcomes	UEPMNT419A	UEPMNT419B Perform civil drafting	MEM40412 MEM50212	No change in outcomes
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10	27 August 2013	<p>Endorsed changes</p> <p>Addition of three new elective units of competency for inclusion in MEM30105.</p> <p>Addition of Skill Set</p> <ul style="list-style-type: none"> MEMSS00001 Non Destructive Testing - Level 2 NDT practitioner <p>ISC upgrades</p> <ul style="list-style-type: none"> ISC correction to MEM50212 ISC code correction in Trade Specialisation Units list to MEM05006C Perform brazing and/or silver soldering (descriptor and range clarified to include braze welding) 																								

Version	TGA Release Date	Modification History
		<ul style="list-style-type: none"> • Change to numbering of Appendices with the reintroduction of MEM05 Units, prerequisites, points and weighting. <ul style="list-style-type: none"> ○ Appendix 1: MEM05 Units, prerequisites, points and weighting. ○ Appendix 2: Trade Specialisation units ○ Appendix 3: Imported units of competency and points and weighting
9	20 December 2012	<p>Endorsed changes:</p> <ol style="list-style-type: none"> 1. 74 new MEM units of competency 2. 32 existing MEM units replaced/not carried forward 3. Three updated qualifications with inclusion of additional elective streams: <ul style="list-style-type: none"> - MEM50212 Diploma of Engineering – Technical - MEM60112 Advanced Diploma of Engineering - MEM80112 Vocational Graduate Diploma of Engineering <p>Refer to summary mapping for details.</p> <p>ISC upgrades:</p> <ol style="list-style-type: none"> 1. MSA Competitive Manufacturing elective units replaced with Competitive Systems and Practices units 2. Additional prerequisite pathway for MEM07004B 3. Five (5) updated qualifications with additional/replaced elective units 4. Three (3) updated qualifications with unit title correction 5. Various typographical errors corrected 6. Appendix 3 re-numbered to 2 7. Appendices removed: <ul style="list-style-type: none"> - Appendix 2: MEM05 units, prerequisites, points and weighting (available on the MSA website Training Package information page: http://www.mskills.com.au/Info.aspx?TAG=MSA.Info.CIP) - Appendix 4: Revised MEM unit codes 2006 - Appendix 5: MEM05 qualifications mapping to MEM98 - Appendix 6: Units of competency mapping to MEM98
8.1	29 August 2012	<p>ISC Upgrade</p> <p>Prerequisite correction in MEM3009A – outcome remains equivalent. Refer to unit for details.</p>
8	25 June 2012	<p>Endorsed changes</p> <ul style="list-style-type: none"> • One (1) new qualification MEM40412 Certificate IV in Engineering Drafting • Twenty five (25) new units of competency • Four (4) existing MEM units not carried forward <p>Refer to Summary Mapping for details.</p> <p>ISC upgrades</p> <ul style="list-style-type: none"> • Five (5) qualifications updated to include new CAD units of competency <ul style="list-style-type: none"> ○ MEM30505 Certificate III in Engineering – Technical ○ MEM50211 Diploma of Engineering – Technical ○ MEM50311 Diploma of Jewellery and Object Design ○ MEM60111 Advanced Diploma of Engineering ○ MEM60211 Advanced Diploma of Jewellery and Object Design • Inclusion of additional fourteen (14) imported units • Imported unit codes updated (MEA) <p>Refer to Summary Mapping for details.</p>
7	30 March 2012	<p>Addition of:</p> <ul style="list-style-type: none"> • One (1) new qualification MEM31112 Certificate III in Engineering (Composites Trade) • Twenty one (21) new units of competency <p>ISC upgrades</p> <p>The new units have also been included as electives in existing MEM qualifications. Refer to Summary Mapping for details.</p>

Version	TGA Release Date	Modification History
		<p>ISC corrections</p> <p>Qualification reloaded (corrected for version 6 but not appearing on TGA):</p> <ul style="list-style-type: none"> MEM50105 – correction to packaging advice for holders of a Certificate IV Errors corrected re dual band status and formatting made consistent for the following units: MEM05026C, MEM05042B, MEM05043B, MEM05044B, MEM05045B, MEM05046B, MEM05053A, MEM05054A, MEM06009A, MEM07016C, MEM07018C, MEM07019C, MEM07020C, MEM07022C, MEM12003B, MEM12004B, MEM13010A, MEM15022B, MEM17001B, MEM17002B, MEM18010C, MEM18011C, MEM18019B, MEM18021B, MEM18022B, MEM18049C, MEM18050C, MEM18054B, MEM18056B, MEM18062B, MEM18065B, MEM18066B, MEM18067B, MEM18091B, MEM18092B, MEM19018B, MEM20008A, MEM20011A, MEM20012A, MEM20013A, MEM24002B, MEM24004B, MEM24006B, MEM24008B, MEM24010B, MEM24012C
6	21 December 2011	<p>Two (2) new qualifications</p> <ul style="list-style-type: none"> MEM40311 Certificate IV in Advanced Jewellery Manufacture MEM80111 Vocational Graduate Diploma of Engineering <p>Forty six (6) new units of competency</p> <p>Thirty two (32) new imported units of competency.</p> <p>ISC upgrades:</p> <ul style="list-style-type: none"> Unit codes corrected in Group D in MEM50311 Band A and 4 points allocated to MEM19038A for use in Certificate IV <p>Qualifications:</p> <ul style="list-style-type: none"> MEM10205 Certificate I in Boating Services <p>The following units missing from the electives have been reinstated:</p> <ul style="list-style-type: none"> - MEM50007B - MEM50008B - MEM50009B - MSAENV272B <ul style="list-style-type: none"> MEM50105 Diploma of Engineering - Advanced Trade <p>- Correction to packaging advice for holders of a Certificate IV</p>
5	27 September 2011	<p>Endorsed changes:</p> <p>Two new qualifications:</p> <ul style="list-style-type: none"> MEM50311 Diploma of Jewellery and Object Design MEM60211 Advanced Diploma of Jewellery and Object Design <p>New and additional units of competency:</p> <ul style="list-style-type: none"> 21 new MEM units 46 additional imported units <p>Refer to summary mapping for details in the Training Package</p> <p>ISC upgrade to one unit</p> <ul style="list-style-type: none"> MEM05006C Perform brazing and/or silver soldering (descriptor and range clarified to include braze welding)
4	June 2011	<p>Additional components:</p> <ul style="list-style-type: none"> 17 new aeronautical and avionic units of competency and 14 additional units of competency imported from MEA07 for inclusion in the following revised MEM qualifications: <ul style="list-style-type: none"> MEM50211 Diploma of Engineering - Technical MEM60111 Advanced Diploma of Engineering <p>• three new MEM high risk units of competency and nine imported high risk</p>

Version	TGA Release Date	Modification History
		<p>licensing units for inclusion as electives in existing MEM qualifications (refer to mapping for details of packaging and qualifications affected)</p> <ul style="list-style-type: none"> • one new unit of competency for the fuel system installation and service sector, for inclusion as an elective in existing MEM qualifications • MEM unit version codes corrected in MEM40105 Refer to Summary Mapping for details of changes to qualifications.
3	March 2011	<p>The following endorsed components have been included in MEM05v3:</p> <ul style="list-style-type: none"> ○ one new qualification - MEM31010 Certificate III in Watch and Clock Service and Repair ○ 23 new specialist watch and clock service and repair units of competency. <p>The new units will also be available as electives in MEM20205, MEM40105 and MEM50105, and have been included in the Certificate III Trade Specialisation unit list.</p> <p>ISC Updates</p> <ul style="list-style-type: none"> ○ All qualifications adjusted to comply with flexibility and sustainability requirements (refer to Mapping for details). ○ Competitive Manufacturing and PMB imported units updated. ○ Additional imported units - MSAENV272B, 472B and 672B. <p>Minor errors corrected in units and Volume 1 (refer History for details).</p>
2.2	30 June 2010	<p>ISC updates</p> <p>Qualifications adjusted to comply with flexibility rules: MEM10105 MEM20105 MEM20205 MEM50205 MEM60105</p> <p>Refer to History for details within the Training Package</p>
2.1	June 2010	<p>PDF reloaded to NTIS with the following corrections:</p> <p>MEM30205 – qualifications notes corrected. No change to the packaging rules.</p> <p>Revised unit listed incorrectly as <i>MEM07008D Perform milling operations</i> – changed to <i>MEM07007C Perform milling operations</i></p>
2	December 2009	<p>Summary of Changes</p> <ul style="list-style-type: none"> • Four new metallurgy units of competency and one new imported unit added to elective bank in MEM40105. • ISC upgrades to 18 existing units • Expanded descriptors for five qualifications (MEM30205, MEM30305, MEM30405, MEM40105 and MEM50105). <p>Refer to History in the Training Package No Purchasing Guide required for version 2</p>
1.02	September 2007	<p>Category 1 changes</p> <p>A range of minor corrections made including typographical errors, omissions and clarifications.</p> <p>Air conditioning and Refrigeration units of competency</p> <p>To meet new licensing requirements for installers of split air conditioning systems and domestic air conditioning and refrigeration systems, one existing unit has been modified and two new units included in the elective banks of MEM05:</p>

Version	TGA Release Date	Modification History
		<p>Modified unit: <i>MEM10013A Install split air conditioning systems and associated pipe work to include aspects of evacuation, testing and pipe work</i></p> <p>This unit replaces and is not equivalent to <i>MEM10012A Install split air conditioning systems</i>. MEM10012A will be discontinued.</p> <p>New units: <i>MEM18084A Commission and decommission split air conditioning systems</i> <i>MEM18085A Install, service and repair domestic air conditioning and refrigeration appliances</i></p> <p>The new and modified units are intended to be available for licensing purposes in MEM20105 Certificate II in Engineering. Due to the flexible and open design of the training package, the units are also available as electives in other qualifications such as those listed below. Discretion should be applied when deciding if the units are suitable for selection within a specific qualification.</p> <p>MEM20105 Certificate II in Engineering MEM20205 Certificate II in Engineering – Production Technology MEM30105 Certificate III in Engineering – Production Systems MEM30205 Certificate III in Engineering – Mechanical Trade MEM30305 Certificate III in Engineering – Fabrication Trade MEM30405 Certificate III in Engineering – Electrical/Electronic Trade MEM30705 Certificate III in Marine Craft Construction MEM40105 Certificate IV in Engineering MEM50105 Diploma of Engineering – Advanced Trade</p>
1.01	October 2006	Decimal points in all MEM05 codes replaced with zero to enable loading to NTIS. Refer to schedule below.
1.00	December 2005	Primary release

Qualifications and Nominal Hours

The following table provides a summary of the qualifications and nominal hours in version 11 of the MEM05 Metals and Engineering Training Package

Note: the new qualification in version 11 is highlighted in red

National Code	National Title	Nominal Hours
MEM10105	Certificate I in Engineering	252
MEM10205	Certificate I in Boating Services	145
MEM20105	Certificate II in Engineering	302
MEM20205	Certificate II in Engineering – Production Technology	576
MEM20305	Certificate II in Boating Services	254
MEM20413	Certificate II in Engineering Pathways	340
MEM30105	Certificate III in Engineering – Production Systems	864
MEM30205	Certificate III in Engineering – Mechanical Trade	864
MEM30305	Certificate III in Engineering – Fabrication Trade	864
MEM30405	Certificate III in Engineering – Electrical/Electronic Trade	864
MEM30505	Certificate III in Engineering – Technical	360
MEM30605	Certificate III in Jewellery Manufacture	864
MEM30705	Certificate III in Marine Craft Construction	864
MEM30805	Certificate III in Locksmithing	864
MEM30905	Certificate III in Boating Services	500
MEM31010	Certificate III in Watch and Clock Service and Repair	864
MEM31112	Certificate III in Engineering (Composite Trade)	870
MEM40105	Certificate IV in Engineering	1184
MEM40205	Certificate IV in Boating Services	747
MEM40311	Certificate IV in Advanced Jewellery Manufacture	1194
MEM40412	Certificate IV in Engineering Drafting	620
MEM50105	Diploma of Engineering – Advanced Trade	1573
MEM50212	Diploma of Engineering – Technical	756
MEM50311	Diploma of Jewellery and Object Design	1060
MEM60112	Advanced Diploma of Engineering	1296
MEM60211	Advanced Diploma of Jewellery and Object Design	1520
MEM80112	Graduate Diploma of Engineering	510

Units of Competency, Nominal Hours and Points

The following table provides a summary of the units of competency, nominal hours in version 11 of the MEM05 Metals and Engineering Training Package

Note: the new units in version 11 are highlighted in red

National Code	National Title	Nominal Hours	Points
MEM03001B	Perform manual production assembly	36	4
MEM03002B	Perform precision assembly	36	4
MEM03003B	Perform sheet and plate assembly	36	4
MEM03004B	Perform electronic/electrical assembly (production)	72	8
MEM03005B	Rework and repair (electrical/electronic production)	72	8
MEM03006B	Set assembly stations	18	2
MEM04001B	Operate melting furnaces	36	4
MEM04002B	Perform gravity die casting	18	2
MEM04003B	Operate pressure die casting machine	36	4
MEM04004B	Prepare and mix sand for metal moulding	36	4
MEM04005C	Produce moulds and cores by hand (jobbing)	144	16
MEM04006B	Operate sand moulding and core making machines	72	8
MEM04007B	Pour molten metal	36	4
MEM04008B	Fettle and trim metal castings/forgings	36	4
MEM04010B	Develop and manufacture wood patterns	180	20
MEM04011B	Produce polymer patterns	72	8
MEM04012B	Assemble plated patterns	72	8
MEM04013B	Develop and manufacture polystyrene patterns	18	2
MEM04014B	Develop and manufacture production patterns	72	8
MEM04015B	Develop and manufacture vacuum forming moulds and associated equipment	54	6
MEM04016C	Develop and manufacture precision models	54	6
MEM04017B	Develop and manufacture gear, conveyor screw and propeller patterns	36	4
MEM04018B	Perform general woodworking machine operations	36	4
MEM04019B	Perform refractory installation and repair	36	4
MEM04020A	Supervise individual ferrous melting and casting operation	40	4
MEM04021A	Supervise individual non ferrous melting and casting operation	40	4
MEM04022A	Examine appropriateness of methoding for mould design	40	4
MEM04023A	Undertake prescribed tests on foundry related materials	40	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	36	4
MEM05002B	Perform high reliability soldering and desoldering	36	4
MEM05003B	Perform soft soldering	36	2
MEM05004C	Perform routine oxy acetylene welding	18	2
MEM05005B	Carry out mechanical cutting	18	2
MEM05006C	Perform brazing and/or silver soldering	18	2
MEM05007C	Perform manual heating and thermal cutting	18	2
MEM05008C	Perform advanced manual thermal cutting, gouging and shaping	18	2
MEM05009C	Perform automated thermal cutting	18	2
MEM05010C	Apply fabrication, forming and shaping techniques	72	8
MEM05011D	Assemble fabricated components	72	8
MEM05012C	Perform routine manual metal arc welding	18	2
MEM05013C	Perform manual production welding	18	2
MEM05014C	Monitor quality of production welding/fabrications	18	2
MEM05015D	Weld using manual metal arc welding process	36	4
MEM05016C	Perform advanced welding using manual metal arc welding process	36	4
MEM05017D	Weld using gas metal arc welding process	36	4
MEM05018C	Perform advanced welding using gas metal arc welding process	36	4
MEM05019D	Weld using gas tungsten arc welding process	36	4

National Code	National Title	Nominal Hours	Points
MEM05020C	Perform advanced welding using gas tungsten arc welding process	36	4
MEM05022C	Perform advanced welding using oxy acetylene welding process	54	6
MEM05023C	Weld using submerged arc welding process	36	4
MEM05024B	Perform welding supervision	108	12
MEM05025C	Perform welding/fabrication inspection	108	12
MEM05026C	Apply welding principles	36	4
MEM05027A	Perform aluminothermic welding	18	2
MEM05036C	Repair/replace/modify fabrications	36	4
MEM05037C	Perform geometric development	54	6
MEM05038B	Perform advanced geometric development – cylindrical/rectangular	18	2
MEM05039B	Perform advanced geometric development – conical	18	2
MEM05040B	Perform advanced geometric development – transitions	36	4
MEM05041B	Weld using powder flame spraying	36	4
MEM05042B	Perform welds to code standards using flux core arc welding process	54	6
MEM05043B	Perform welds to code standards using gas metal arc welding process	54	6
MEM05044B	Perform welds to code standards using gas tungsten arc welding process	54	6
MEM05045B	Perform pipe welds to code standards using manual metal arc welding process	54	6
MEM05046B	Perform welds to code standards using manual metal arc welding process	54	6
MEM05047B	Weld using flux core arc welding process	36	4
MEM05048B	Perform advanced welding using flux core arc welding process	36	4
MEM05049B	Perform routine gas tungsten arc welding	18	2
MEM05050B	Perform routine gas metal arc welding	18	2
MEM05051A	Select welding processes	18	2
MEM05052A	Apply safe welding practices	36	4
MEM05053A	Set and edit computer controlled thermal cutting machines	36	4
MEM05054A	Write basic NC/CNC programs for thermal cutting machines	36	4
MEM06001B	Perform hand forging	36	4
MEM06002B	Perform hammer forging	36	4
MEM06003C	Carry out heat treatment	54	6
MEM06004B	Select heat treatment processes and test finished product	54	6
MEM06005B	Perform drop and upset forging	36	4
MEM06006C	Repair springs	36	4
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	18	2
MEM06008A	Hammer forge complex shapes	36	4
MEM06009A	Hand forge complex shapes	36	4
MEM07001B	Perform operational maintenance of machines/equipment	18	2
MEM07002B	Perform precision shaping/ lanning/slotting operations	36	4
MEM07003B	Perform machine setting (routine)	36	4
MEM07004B	Perform machine setting (complex)	72	8
MEM07005C	Perform general machining	72	8
MEM07006C	Perform lathe operations	36	4
MEM07007C	Perform milling operations	36	4
MEM07008D	Perform grinding operations	36	4
MEM07009B	Perform precision jig boring operations	36	4
MEM07010B	Perform tool and cutter grinding operations	36	4
MEM07011B	Perform complex milling operations	36	4
MEM07012B	Perform complex grinding operations	36	4
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines	36	4
MEM07014B	Perform electro-discharge (EDM) machining operations	36	4
MEM07015B	Set computer controlled machines/processes	18	2
MEM07016C	Set and edit computer controlled machines/processes	36	4
MEM07018C	Write basic NC/CNC programs	36	4
MEM07019C	Program NC/CNC machining centre	18	2

National Code	National Title	Nominal Hours	Points
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre	18	2
MEM07021B	Perform complex lathe operations	36	4
MEM07022C	Program CNC wire cut machines	18	2
MEM07023C	Program and set up CNC manufacturing cell	54	
MEM07024B	Operate and monitor machine/process	36	4
MEM07025B	Perform advanced machine/process operation	54	6
MEM07026B	Perform advanced plastic processing	54	6
MEM07027B	Perform advanced press operations	54	6
MEM07028B	Operate computer controlled machines/processes	18	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	36	4
MEM07030C	Perform metal spinning lathe operations (basic)	72	8
MEM07031C	Perform metal spinning lathe operations (complex)	36	4
MEM07032B	Use workshop machines for basic operations	18	2
MEM07033B	Operate and monitor basic boiler	54	6
MEM07034A	Operate and monitor intermediate class boiler	36	4
MEM07039A	Write programs for industrial robots	36	4
MEM07040A	Set multistage integrated processes	54	6
MEM07041A	Perform production machining	70	0
MEM07042A	Undertake corrections and basic maintenance to aluminium extrusion dies and die support systems	36	4
MEM07043A	Identify causes of faulty aluminium extrusions	54	6
MEM07044A	Test a new aluminium extrusion die	36	4
MEM08001B	Perform wire, jig and barrel load/unload work	36	4
MEM08002C	Pre-treat work for subsequent surface coating	36	4
MEM08003C	Perform electroplating operations	54	6
MEM08004B	Finish work using wet, dry and vapour deposition methods	36	4
MEM08005B	Prepare and produce specialised coatings	36	4
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	18	2
MEM08007B	Control surface finish production and finished product quality	36	4
MEM08008B	Operate and control surface finishing waste treatment process	27	3
MEM08009C	Make up solutions	18	2
MEM08010B	Manually finish/polish materials	54	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	18	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	36	4
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	36	4
MEM08014B	Apply protective coatings (basic)	36	4
MEM08015B	Apply protective coatings (advanced)	36	4
MEM08016B	Control blast coating by-products, materials and emissions	9	1
MEM08018B	Electroplate engineering coatings	54	6
MEM08019B	Electroplate protective finishes	54	6
MEM08020B	Electroplate decorative finishes	54	6
MEM09002B	Interpret technical drawing	36	4
MEM09003B	Prepare basic engineering drawing	72	8
MEM09004B	Perform electrical/electronic detail drafting	72	8
MEM09005B	Perform basic engineering detail drafting	72	8
MEM09006B	Perform advanced engineering detail drafting	36	4
MEM09007B	Perform advanced mechanical detail drafting	36	4
MEM09008B	Perform advanced structural detail drafting	36	4
MEM09009C	Create 2D drawings using computer aided design system	72	8
MEM09010C	Create 3D models using computer aided design system	36	4
MEM09011B	Apply basic engineering design concepts	54	6
MEM09021B	Interpret and produce curved 3-dimensional shapes	36	4
MEM09022A	Create 2D code files using computer aided manufacturing system	72	4
MEM09023A	Create 3D code files using computer aided manufacturing system	144	6
MEM09143A	Represent aeronautical engineering designs	72	0

National Code	National Title	Nominal Hours	Points
MEM09144A	Represent avionic engineering designs	72	0
MEM09153A	Apply computer-aided modelling and data management techniques to aeronautical engineering designs	72	0
MEM09154A	Apply computer-aided modelling and data management techniques to avionic engineering designs	72	0
MEM09155A	Prepare mechanical models for computer-aided engineering (CAE)	40	0
MEM09156A	Prepare mechatronic models for computer-aided engineering (CAE)	40	0
MEM09157A	Perform mechanical engineering design drafting	60	0
MEM09158A	Perform mechatronics engineering design drafting	70	0
MEM09201A	Work effectively in an engineering drafting workplace	20	0
MEM09202A	Produce freehand sketches	40	0
MEM09203A	Measure and sketch site information	40	0
MEM09204A	Produce basic engineering detail drawings	72	0
MEM09205A	Produce electrical schematic drawings	72	0
MEM09206A	Produce drawings for mechanical services	60	0
MEM09207A	Produce drawings for reticulated services	60	0
MEM09208A	Detail fasteners and locking devices in mechanical drawings	40	0
MEM09209A	Detail bearings, seals and other componentry in mechanical drawings	40	0
MEM09210A	Create 3-D solid models using computer-aided design (CAD) system	80	0
MEM09211A	Produce drawings or models for industrial piping	60	0
MEM09212A	Produce detailed drawings of steel to non-steel connections	60	0
MEM09213A	Produce schematic drawings for hydraulic and pneumatic fluid power systems	60	0
MEM09214A	Perform advanced engineering detail drafting	80	0
MEM09215A	Supervise detail drafting projects	40	0
MEM09216A	Interpret and produce curved 3-D shapes and patterns	36	0
MEM09217A	Prepare plans for pipe and duct fabrication	40	0
MEM09218A	Participate in drafting projects for building services	40	0
MEM09219A	Prepare drawings for fabricated sheet metal products	40	0
MEM09220A	Apply surface modelling techniques to 3-D drawings	80	0
MEM09221A	Create 3-D model assemblies using computer-aided design (CAD) system	80	0
MEM09222A	Interpret and maintain or restore original drawings	20	0
MEM10001C	Erect structures	36	4
MEM10002B	Terminate and connect electrical wiring	27	3
MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	88	12
MEM10004B	Enter and change programmable controller operational parameters	18	2
MEM10005B	Commission programmable controller programs	36	4
MEM10006B	Install machine/plant	36	4
MEM10007C	Modify control systems	54	6
MEM10008B	Undertake commissioning procedures for plant and/or equipment	36	4
MEM10009B	Install refrigeration and air conditioning plant and equipment	36	4
MEM10010B	Install pipework and pipework assemblies	36	4
MEM10011B	Terminate and connect specialist cables	27	3
MEM10013A	Install split air conditioning systems and associated pipework	36	6
MEM11001C	Erect/dismantle scaffolding and equipment	36	4
MEM11002C	Erect/dismantle complex scaffolding and equipment	36	4
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	36	4
MEM11004B	Undertake dogging	36	4
MEM11005B	Pick and process order	36	4
MEM11006B	Perform production packaging	18	2
MEM11007B	Administer inventory procedures	36	4
MEM11008B	Package materials (stores and warehouse)	18	2
MEM11009B	Handle/move bulk fluids/gases	36	4
MEM11010B	Operate mobile load shifting equipment	36	4
MEM11011B	Undertake manual handling	18	2

National Code	National Title	Nominal Hours	Points
MEM11012B	Purchase materials	54	6
MEM11013B	Undertake warehouse receipt process	36	4
MEM11014B	Undertake warehouse dispatch process	36	4
MEM11015B	Manage warehouse inventory system	54	6
MEM11016B	Order materials	18	2
MEM11017B	Organise and lead stocktakes	36	4
MEM11018B	Organise and maintain warehouse stock receipt and/or dispatch system	54	6
MEM11019B	Undertake tool store procedures	36	4
MEM11020B	Perform advanced warehouse computer operations	36	4
MEM11021B	Perform advanced operation of load shifting equipment	18	2
MEM11022B	Operate fixed/movable load shifting equipment	36	4
MEM11023A	Operate a bridge and gantry crane	9	4
MEM11024A	Undertake basic rigging	9	4
MEM11025A	Operate a non-slewing mobile crane of greater than three tonnes capacity	9	4
MEM12001B	Use comparison and basic measuring devices	18	2
MEM12002B	Perform electrical/electronic measurement	18	2
MEM12003B	Perform precision mechanical measurement	18	2
MEM12004B	Perform precision electrical/electronic measurement	36	4
MEM12005B	Calibrate measuring equipment	54	6
MEM12006C	Mark off/out (general engineering)	36	4
MEM12007D	Mark off/out structural fabrications and shapes	36	4
MEM12019B	Measure components using coordinate measuring machines	36	4
MEM12020B	Set and operate coordinate measuring machines	18	2
MEM12021B	Program coordinate measuring machines	36	4
MEM12022B	Program coordinate measuring machines (advanced)	18	2
MEM12023A	Perform engineering measurements	48	5
MEM12024A	Perform computations	27	3
MEM12025A	Use graphical techniques and perform simple statistical computations	18	2
MEM13001B	Perform emergency first aid	9	1
MEM13002B	Undertake occupational health and safety activities in the workplace	27	3
MEM13003B	Work safely with industrial chemicals and materials	18	2
MEM13004B	Work safely with molten metals/glass	18	2
MEM13006B	Collect and evaluate occupational health and safety data for an enterprise or section of an enterprise	36	4
MEM13007B	Maintain water treatment systems for cooling towers	18	2
MEM13010A	Supervise occupational health and safety in an industrial work environment	36	4
MEM13013B	Work safely with ionizing radiation	36	4
MEM13014A	Apply principles of occupational health and safety in the work environment	4	0
MEM14001B	Schedule material deliveries	72	8
MEM14002B	Undertake basic process planning	72	8
MEM14003B	Undertake basic production scheduling	72	8
MEM14004A	Plan to undertake a routine task	4	0
MEM14005A	Plan a complete activity	32	4
MEM14065A	Plan and design aeronautical engineering projects	54	0
MEM14066A	Plan and design avionics engineering projects	54	0
MEM14083A	Apply aeronautical engineering fundamentals to support design and development of engineering projects	54	0
MEM14084A	Apply avionics engineering fundamentals to support design and development of engineering projects	54	0
MEM14085A	Apply mechanical engineering analysis techniques	60	0
MEM14086A	Apply mechatronics engineering analysis techniques	40	0
MEM14087A	Apply manufactured product design techniques	40	0
MEM14088A	Apply maintenance engineering techniques to equipment and component repairs and modifications	70	0
MEM14089A	Integrate mechanical fundamentals into an engineering task	55	0

National Code	National Title	Nominal Hours	Points
MEM14090A	Integrate mechatronic fundamentals into an engineering task	55	0
MEM14091A	Integrate manufacturing fundamentals into an engineering task	55	0
MEM14092A	Integrate maintenance fundamentals into an engineering task	55	0
MEM15001B	Perform basic statistical quality control	18	2
MEM15002A	Apply quality systems	16	2
MEM15003B	Use improvement processes in team activities	36	4
MEM15004B	Perform inspection	18	2
MEM15005B	Select and control inspection processes and procedures	36	4
MEM15007B	Conduct product and/or process capability studies	54	6
MEM15008B	Perform advanced statistical quality control	18	2
MEM15010B	Perform laboratory procedures	72	8
MEM15011B	Exercise external quality assurance	54	6
MEM15012B	Maintain/supervise the application of quality procedures	36	4
MEM15015B	Examine trading practices	45	5
MEM15016B	Inspect pre-packed articles	72	8
MEM15017B	Use and maintain reference standards	27	3
MEM15018B	Investigate consumer complaints	54	6
MEM15019B	Conduct a field inspection	108	12
MEM15020C	Perform verification/certification or in-service inspection	108	12
MEM15021C	Conduct audits of servicing licensees and public weighbridge licensees	36	4
MEM15022B	Verify reference standards	72	8
MEM15024A	Apply quality procedures	4	0
MEM16001B	Give formal presentations and take part in meetings	18	2
MEM16002C	Conduct formal interviews and negotiations	36	4
MEM16003B	Provide advanced customer service	18	2
MEM16004B	Perform internal/external customer service	18	2
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	18	2
MEM16006A	Organise and communicate information	18	2
MEM16007A	Work with others in a manufacturing, engineering or related environment	4	0
MEM16008A	Interact with computing technology	18	2
MEM16009A	Research and analyse engineering information	18	2
MEM16010A	Write reports	18	2
MEM16011A	Communicate with individuals and small groups	18	2
MEM16012A	Interpret technical specifications and manuals	36	4
MEM16013A	Operate in a self-directed team	18	2
MEM16014A	Report technical information	18	2
MEM17001B	Assist in development and deliver training in the workplace	18	2
MEM17002B	Conduct workplace assessment	18	2
MEM17003A	Assist in the provision of on the job training	18	2
MEM18001C	Use hand tools	18	2
MEM18002B	Use power tools/hand held operations	18	2
MEM18003C	Use tools for precision work	36	4
MEM18004B	Maintain and overhaul mechanical equipment	36	4
MEM18005B	Perform fault diagnosis, installation and removal of bearings	36	4
MEM18006C	Repair and fit engineering components	54	6
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	36	4
MEM18008B	Balance equipment	18	2
MEM18009B	Perform levelling and alignment of machines and engineering components	36	4
MEM18010C	Perform equipment condition monitoring and recording	36	4
MEM18011C	Shut down and isolate machines/equipment	18	2
MEM18012B	Perform installation and removal of mechanical seals	18	2
MEM18013B	Perform gland packing	18	2
MEM18014B	Manufacture press tools and gauges	72	8

National Code	National Title	Nominal Hours	Points
MEM18015B	Maintain tools and dies	36	4
MEM18016B	Analyse plant and equipment condition monitoring results	36	4
MEM18017C	Modify mechanical systems and equipment	72	8
MEM18018C	Maintain pneumatic system components	36	4
MEM18019B	Maintain pneumatic systems	36	4
MEM18020B	Maintain hydraulic system components	36	4
MEM18021B	Maintain hydraulic systems	36	4
MEM18022B	Maintain fluid power controls	72	8
MEM18023B	Modify fluid power system operation	72	8
MEM18024B	Maintain engine cooling systems	18	2
MEM18025B	Service combustion engines	18	2
MEM18026C	Test compression ignition fuel systems	36	4
MEM18027C	Overhaul engine fuel system components	72	8
MEM18028B	Maintain engine lubrication systems	18	2
MEM18029B	Tune diesel engines	36	4
MEM18030B	Diagnose and rectify low voltage electrical systems	72	8
MEM18031B	Diagnose and rectify low voltage starting systems	18	2
MEM18032B	Maintain induction/exhaust systems	36	4
MEM18033B	Perform engine bottom-end overhaul	36	4
MEM18034B	Perform engine top-end overhaul	72	8
MEM18035B	Diagnose and rectify braking systems	54	6
MEM18037B	Diagnose and rectify low voltage charging systems	18	2
MEM18038B	Maintain wheels and tyres	18	2
MEM18039B	Diagnose and rectify track type undercarriage	36	4
MEM18040B	Maintain suspension systems	36	4
MEM18041B	Maintain steering systems	36	4
MEM18042C	Diagnose and rectify manual transmissions	36	4
MEM18043C	Diagnose and rectify automatic transmissions	72	8
MEM18044C	Diagnose and rectify drive line and final drives	36	4
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	36	4
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	90	10
MEM18047B	Diagnose and maintain electronic controlling systems on mobile plant	36	4
MEM18048B	Fault find and repair/rectify basic electrical circuits	108	12
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	27	3
MEM18050C	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	27	3
MEM18051B	Fault find and repair/rectify complex electrical circuits	54	6
MEM18052B	Maintain fluid power systems for mobile plant	36	4
MEM18053B	Modify fluid power control systems	54	6
MEM18054B	Fault find, test and calibrate instrumentation systems and equipment	72	8
MEM18055B	Dismantle, replace and assemble engineering components	27	3
MEM18056B	Diagnose and repair analog equipment and components	90	10
MEM18057B	Maintain/service analog/digital electronic equipment	54	6
MEM18058C	Modify electronic equipment	36	4
MEM18059B	Modify electronic systems	36	4
MEM18060B	Maintain, repair control instrumentation – single and multiple loop control systems	72	8
MEM18061B	Maintain/calibrate complex control systems	72	8
MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	72	8
MEM18063B	Terminate signal and data cables	36	4
MEM18064B	Maintain instrumentation system components	54	6
MEM18065B	Diagnose and repair digital equipment and components	90	10
MEM18066B	Diagnose and repair microprocessor-based equipment	54	6
MEM18067B	Tune control loops – multi controller or multi element systems	54	6

National Code	National Title	Nominal Hours	Points
MEM18069B	Maintain, repair instrumentation process control analysers	54	6
MEM18070C	Modify complex electrical circuits and systems	54	6
MEM18071B	Connect/disconnect fluid conveying system components	18	2
MEM18072B	Manufacture fluid conveying conductor assemblies	36	4
MEM18073A	Perform advanced equipment testing and diagnostics on mobile plant and equipment	72	8
MEM18084A	Commission and decommission split air conditioning systems	36	4
MEM18085A	Install, service and repair domestic air conditioning and refrigeration appliances	55	6
MEM18086B	Test, recover, evacuate and charge refrigeration systems	36	4
MEM18087B	Service and repair domestic and light commercial refrigeration and air conditioning equipment	54	6
MEM18088B	Maintain and repair commercial air conditioning systems and components	36	4
MEM18089B	Maintain and repair central air handling systems	54	6
MEM18090B	Maintain and repair industrial refrigeration systems and components	54	6
MEM18091B	Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems	36	4
MEM18092B	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	54	6
MEM18093B	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	72	8
MEM18094B	Service and repair commercial refrigeration	54	6
MEM18095A	Maintain and repair cooling towers/evaporative condensers and associated equipment	36	4
MEM18096A	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	54	6
MEM18097A	Manufacture cavity dies	72	8
MEM18098A	Prepare to perform work associated with fuel system installation and servicing	18	2
MEM19001B	Perform jewellery metal casting	54	6
MEM19002B	Prepare jewellery illustrations	36	4
MEM19003B	Handle gem materials	18	2
MEM19004B	Handle and examine gemstone materials	54	6
MEM19005B	Produce three-dimensional precision items	72	8
MEM19006B	Replace watch batteries	9	1
MEM19007B	Perform gemstone setting	54	6
MEM19008B	Prepare jewellery designs	54	6
MEM19009B	Perform investment procedures for lost wax casting process	9	1
MEM19010B	Produce rubber moulds for lost wax casting process	18	2
MEM19011B	Perform wax injection of moulds for lost wax casting process	18	2
MEM19012B	Produce jewellery wax model	36	4
MEM19013B	Produce jewellery metal masters	36	4
MEM19014B	Perform hand engraving	36	4
MEM19015B	Perform jewellery enamelling	36	4
MEM19016B	Construct jewellery components	36	4
MEM19017B	Fabricate jewellery items	54	6
MEM19018B	Repair jewellery items	54	6
MEM19020B	Fault-find and maintain micro-mechanisms	36	4
MEM19021B	Diagnose and service micro-mechanisms	54	6
MEM19022B	Perform precision micro-mechanism diagnosis and servicing	54	6
MEM19023A	Apply drawing and rendering techniques to jewellery or object design	36	4
MEM19024A	Use CAD to create and display 3D jewellery and object models	36	4
MEM19025A	Create and present designs for jewellery and other 3D objects	36	4
MEM19026A	Investigate quality and application of jewellery materials	18	2
MEM19027A	Produce life drawings for presenting jewellery and object designs	72	0
MEM19028A	Select materials and new technologies for jewellery and 3D object design applications	18	2
MEM19029A	Produce a professional jewellery design and 3D object portfolio	36	0

National Code	National Title	Nominal Hours	Points
MEM19030A	Research and design sustainable objects	54	0
MEM19031A	Produce renderings and technical drawings for jewellery and object design construction	18	2
MEM19032A	Design and implement mechanisms in jewellery items	72	0
MEM19033A	Create silversmithing objects	36	4
MEM19034A	Apply chain manufacture process	18	2
MEM19035A	Plan and apply casting techniques for jewellery and object designs	36	4
MEM19036A	Use specialised techniques to produce jewellery and objects	54	0
MEM19037A	Plan and implement chenier fabrication process	18	2
MEM19038A	Apply traditional techniques to jewellery and 3D object production	54	4
MEM19039A	Plan, conduct and supervise a jewellery and object exhibition	54	0
MEM19040A	Create and manufacture jewellery or object design prototypes for the mass	54	0
MEM19041A	Experiment with jewellery	54	0
MEM19042A	Render images using computer graphics software	36	0
MEM19043A	Oversee jewellery or object design production	72	0
MEM19044A	Repair and restore antique jewellery	36	4
MEM19045A	Set gems in channel style settings	36	4
MEM19046A	Apply grain setting techniques	36	4
MEM19047A	Set gems in claw and bezel style settings	36	4
MEM19048A	Develop and apply complex borders and decorations for hand engraving	36	4
MEM19049A	Develop and apply heraldic designs for hand engraving	18	2
MEM19050A	Hand carve engraving work	36	4
MEM19051A	Construct multiple stone settings	36	4
MEM19052A	Produce complex objects using silversmithing techniques	36	4
MEM19053A	Create complex findings and mechanisms for jewellery items	36	4
MEM19054A	Fabricate platinum jewellery items	36	4
MEM20001A	Produce keys	36	4
MEM20002A	Assemble and test lock mechanisms	54	6
MEM20003A	Install and upgrade locks and hardware	36	4
MEM20004A	Gain entry	36	4
MEM20005A	Install and maintain door control devices/systems	18	2
MEM20006A	Maintain and service mechanical locking devices	54	6
MEM20007A	Plan and prepare a masterkey system	54	4
MEM20008A	Develop and implement a masterkey system	36	6
MEM20009A	Gain entry and reinstate fire and security containers	36	4
MEM20010A	Gain entry and reinstate automotive locking systems	36	4
MEM20011A	Service and repair fire and security containers	54	6
MEM20012A	Service and repair mechanical automotive locking systems	54	4
MEM20013A	Service automotive transponder systems	18	2
MEM20014A	Perform a site security survey	18	2
MEM21001A	Replace watch batteries, capacitors and bands	18	2
MEM21002A	Perform watch movement exchange	18	2
MEM21003A	Perform watch case servicing, repair and refurbishment	36	4
MEM21004A	Clean watch and clock components	18	2
MEM21005A	Diagnose faults in quartz watches	18	2
MEM21006A	Service quartz watches	36	4
MEM21007A	Service complex quartz watches	36	4
MEM21008A	Service mechanical watches	36	4
MEM21009A	Inspect, diagnose, adjust and repair mechanical watches	36	4
MEM21010A	Service watch power generating systems	18	2
MEM21011A	Service calendar and other dial indication mechanisms for watches	36	4
MEM21012A	Service and repair mechanical watch oscillating systems	36	4
MEM21013A	Service, test and adjust watch escapements	36	4
MEM21014A	Service mechanical chronograph watches	54	6
MEM21015A	Perform precision watch timing and adjustment	54	6
MEM21016A	Install and set up clocks	18	2

National Code	National Title	Nominal Hours	Points
MEM21017A	Service and repair clock timepieces	54	6
MEM21018A	Service clock escapements and oscillating systems	36	4
MEM21019A	Service and repair clock striking mechanisms	36	4
MEM21020A	Service and repair clock chiming mechanisms	54	6
MEM21021A	Restore clockwork mechanisms	54	6
MEM21022A	Manufacture watch and clock components	54	6
MEM21023A	Plan, set up and operate horological workshop or service centre	36	4
MEM22001A	Perform engineering activities	40	0
MEM22002A	Manage self in the engineering environment	40	0
MEM22007A	Manage environmental effects of engineering activities	40	0
MEM22012A	Coordinate resources for an engineering project or operation	20	0
MEM22013A	Coordinate engineering projects	40	0
MEM22014A	Coordinate engineering-related manufacturing operations	40	0
MEM22015A	Source and estimate engineering materials requirements	20	0
MEM22017A	Coordinate continuous improvement and technical development	60	0
MEM22018A	Coordinate sales and promotion of engineering-related products or services	20	0
MEM23003A	Operate and program computers and/or controllers in engineering situations	40	0
MEM23004A	Apply technical mathematics	40	0
MEM23005A	Apply statistics and probability techniques to engineering tasks	35	0
MEM23006A	Apply fluid and thermodynamics principles in engineering	70	0
MEM23007A	Apply calculus to engineering tasks	40	0
MEM23008A	Apply advanced algebra and numerical methods to engineering tasks	100	0
MEM23041A	Apply basic scientific principles and techniques in mechanical engineering situations	140	0
MEM23052A	Apply basic electro and control scientific principles and techniques in aeronautical engineering situations	54	0
MEM23063A	Select and test mechanical engineering materials	20	0
MEM23064A	Select and test mechatronic engineering materials	20	0
MEM23073A	Select and apply aeronautical engineering methods, processes and construction techniques	54	0
MEM23074A	Select and apply avionic engineering methods, processes and construction techniques	54	0
MEM23084A	Apply scientific principles and techniques in aeronautical engineering situations	54	0
MEM23086A	Apply scientific principles and techniques in avionic engineering situations	54	0
MEM23095A	Apply aeronautical systems design principles and techniques in aeronautical engineering situations	54	0
MEM23096A	Apply avionic system design principles and techniques in avionic engineering situations	54	0
MEM23097A	Apply automated systems principles and techniques in aeronautical engineering situations	54	0
MEM23098A	Apply automated systems principles and techniques in avionic engineering situations	54	0
MEM23109A	Apply engineering mechanic principles	55	0
MEM23111A	Select electrical equipment and components for engineering applications	35	0
MEM23112A	Investigate electrical and electronic controllers in engineering applications	35	0
MEM23113A	Evaluate hydrodynamic systems and system components	55	0
MEM23114A	Evaluate thermodynamic systems and components	55	0
MEM23115A	Evaluate fluid power systems	55	0
MEM23116A	Evaluate programmable logic controller and related control system component applications	55	0
MEM23117A	Evaluate microcontroller applications	55	0
MEM23118A	Apply production and service control techniques	70	0
MEM23119A	Evaluate continuous improvement processes	70	0

National Code	National Title	Nominal Hours	Points
MEM23120A	Select mechanical machine and equipment components	70	0
MEM23121A	Analyse loads on frames and mechanisms	70	0
MEM23122A	Evaluate computer integrated manufacturing systems	40	0
MEM23123A	Evaluate manufacturing processes	40	0
MEM23124A	Measure and analyse noise and vibration	55	0
MEM23125A	Evaluate maintenance systems	55	0
MEM23126A	Evaluate industrial robotic applications	55	0
MEM23129A	Evaluate thermal loads in heating, ventilation, air conditioning and refrigeration	70	0
MEM23130A	Coordinate servicing and fault-finding of HVAC/R control systems	55	0
MEM23131A	Evaluate rapid prototyping applications	55	0
MEM23132A	Evaluate rapid manufacturing processes	55	0
MEM23133A	Evaluate rapid tooling applications	55	0
MEM23134A	Evaluate jigs and fixtures	35	0
MEM23135A	Evaluate moulding tools and processes	35	0
MEM23136A	Evaluate stamping and forging	35	0
MEM23137A	Evaluate rolling tools and processes	35	0
MEM23138A	Evaluate suitability of materials for engineering-related applications	35	0
MEM23140A	Determine operational parameters for building HVAC hydronic systems	35	0
MEM23141A	Complete a building thermal performance survey	70	0
MEM23142A	Determine psychrometric processes and systems performance	55	0
MEM23143A	Apply energy management principles	70	0
MEM23144A	Contribute to the design of a commercial refrigeration system	90	0
MEM23145A	Apply codes and regulations to air conditioning designs	70	0
MEM23146A	Contribute to the design of industrial refrigeration systems	70	0
MEM23147A	Contribute to the design of hydronic systems	35	0
MEM23148A	Develop energy management solutions	35	0
MEM23149A	Contribute to the design of commercial and industrial exhaust systems	35	0
MEM23150A	Contribute to the design of heating systems	35	0
MEM23151A	Commission and optimise performance of HVAC/R systems	35	0
MEM23152A	Apply principles of refrigeration food storage technology	35	0
MEM23153A	Contribute to the design of heat exchanger systems	35	0
MEM23154A	Analyse and service HVAC/R systems	70	0
MEM234001B	Plan and manage engineering-related projects or operations	36	0
MEM234002A	Integrate engineering technologies	36	0
MEM234003A	Design machines and ancillary equipment	54	0
MEM234004A	Design for engineering-related noise and vibration mitigation	54	0
MEM234005A	Design hydrodynamic pumping systems	54	0
MEM234006A	Evaluate and select thermodynamic systems or subsystems	36	0
MEM234007A	Design fluid power systems	36	0
MEM234008A	Design plant using computer simulations	36	0
MEM234009A	Design computer-integrated manufacturing systems	54	0
MEM234010A	Design microcontroller applications	36	0
MEM234011A	Design programmable logic controller applications	54	0
MEM234012A	Design integrated maintenance management systems	54	0
MEM234013A	Plan and design engineering-related manufacturing processes	54	0
MEM234014A	Design a robotic system	36	0
MEM234015A	Design hydronic heat exchanger systems	36	0
MEM234016A	Design refrigeration systems	36	0
MEM234017A	Design exhaust, ventilation and dust collection systems	36	0
MEM234018A	Design heating, ventilation, air conditioning and refrigeration control systems	54	0
MEM234019A	Apply finite element analysis in engineering design	36	0
MEM234020A	Coordinate small lot manufacture using rapid manufacture processes	36	0
MEM234021A	Apply statistics to technology problems	36	0

National Code	National Title	Nominal Hours	Points
MEM234022A	Apply advanced calculus to technology problems	36	0
MEM234023A	Apply differential equations to technology problems	36	0
MEM234024A	Apply advanced mathematics in technology problems	36	0
MEM234025A	Apply numerical methods to technology problems	36	0
MEM234026A	Develop and coordinate engineering-related contingency plans	36	0
MEM234027A	Plan and manage materials supply for an engineering project or manufacturing operation	36	0
MEM234028A	Produce and manage technical documentation	36	0
MEM234029A	Produce and manage technical publications	36	0
MEM234030A	Provide specialised technical and engineering guidance to other technical employees	36	0
MEM234031A	Manage installation, commissioning or modification of machines and equipment	54	0
MEM234032A	Manage fluid power related technologies in an enterprise	36	0
MEM234033A	Lead engineering-related quality operations in an enterprise	36	0
MEM234034A	Manage heating, ventilation, air conditioning and refrigeration systems or projects	36	0
MEM234035A	Maintain and apply technical and engineering skills	36	0
MEM234036A	Apply configuration management procedures in engineering project management	70	0
MEM234037A	Perform maintenance-related integrated logistic support management activities	70	0
MEM234038A	Apply systems engineering procedures to engineering design project management	70	0
MEM24001B	Perform basic penetrant testing	18	2
MEM24002B	Perform penetrant testing	36	4
MEM24003B	Perform basic magnetic particle testing	18	2
MEM24004B	Perform magnetic particle testing	36	4
MEM24005B	Perform basic eddy current testing	18	2
MEM24006B	Perform eddy current testing	54	6
MEM24007B	Perform ultrasonic thickness testing	18	2
MEM24008B	Perform ultrasonic testing	54	6
MEM24009B	Perform basic radiographic testing	18	2
MEM24010B	Perform radiographic testing	54	6
MEM24011B	Establish non-destructive tests	108	12
MEM24012C	Apply metallurgy principles	36	4
MEM25001B	Apply fibre-reinforced materials	18	2
MEM25002B	Form and integrate fibre-reinforced structures	36	4
MEM25003B	Set up marine vessel structures	36	4
MEM25004B	Fair and shape surfaces	18	2
MEM25005B	Construct and assemble marine vessel timber components	72	8
MEM25006B	Undertake marine sheathing operations	18	2
MEM25007B	Maintain marine vessel surfaces	36	4
MEM25008B	Repair marine vessel surfaces and structures	18	4
MEM25009B	Form timber shapes using hot process	18	2
MEM25010B	Perform fitout procedures	36	4
MEM25011B	Install marine systems	72	8
MEM25012B	Install and test operations of marine auxiliary systems	54	6
MEM25013B	Produce three-dimensional plugs/moulds	108	12
MEM25014B	Perform marine slipping operations	36	2
MEM25015A	Assemble and install equipment and accessories/ancillaries	18	2
MEM26001A	Lay up composites using open moulding techniques	54	6
MEM26002A	Lay up composites using vacuum closed moulding techniques	54	6
MEM26003A	Lay up composites using pressure closed moulding techniques	54	6
MEM26004A	Make basic plugs for composites fabrication	27	3
MEM26005A	Make basic moulds for composites fabrication	27	3
MEM26006A	Mark and cut out sheets for composite use	36	4
MEM26007A	Select and use reinforcing appropriate for product	36	4
MEM26008A	Select and use resin systems appropriate for product	36	4

National Code	National Title	Nominal Hours	Points
MEM26009A	Select and use cores and fillers appropriate for product	18	2
MEM26010A	Store and handle composite materials	18	2
MEM26011A	Determine materials and techniques for a composite component or product	54	6
MEM26012A	Record and trial work processes for one-off composite products	36	4
MEM26013A	Select and use composite processes or systems appropriate for product	36	4
MEM26014A	Adjust resin chemicals for current conditions	36	4
MEM26015A	Select and apply repair techniques	54	6
MEM26016A	Select and use joining techniques	54	6
MEM26017A	Prepare composite or other substrate surfaces	36	4
MEM26018A	Organise composite trials	36	4
MEM26019A	Finish a composite product	36	4
MEM26020A	Identify and interpret required standards for composites	18	2
MEM30001A	Use computer aided drafting systems to produces basic engineering drawings	40	0
MEM30002A	Produce basic engineering graphics	36	0
MEM30003A	Produce detailed engineering drawings	20	0
MEM30004A	Use CAD to create and display 3D models	40	0
MEM30005A	Calculate force systems within simple beam structures	30	0
MEM30006A	Calculate stresses in simple structures	24	0
MEM30007A	Select common engineering materials	40	0
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	20	0
MEM30009A	Contribute to the design of basic mechanical systems	40	0
MEM30010A	Set up basic hydraulic circuits	20	0
MEM30011A	Set up basic pneumatic circuits	24	0
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	60	4
MEM30013A	Assist in the preparation of a basic workplace layout	40	0
MEM30014A	Apply basic just in time systems to the reduction of waste	40	0
MEM30015A	Develop recommendations for basic set up time improvements	40	0
MEM30016A	Assist in the analysis of a supply chain	40	0
MEM30017A	Use basic preventative maintenance techniques and tools	40	0
MEM30018A	Undertake basic process planning	40	0
MEM30019A	Use resource planning software systems in manufacturing	40	0
MEM30020A	Develop and manage a plan for a simple manufacturing related project	40	0
MEM30021A	Prepare a simple production schedule	40	0
MEM30022A	Undertake supervised procurement activities	20	0
MEM30023A	Prepare a simple cost estimate for a manufactured product	40	0
MEM30024A	Participate in quality assurance techniques	20	0
MEM30025A	Analyse a simple electrical system circuit	20	0
MEM30026A	Select and test components for simple electronic switching and timing circuits	20	0
MEM30027A	Prepare basic programs for programmable logic controllers	20	0
MEM30028A	Assist in sales of technical products/systems	20	0
MEM30029A	Use workshop equipment and processes to complete an engineering project	55	0
MEM30031A	Operate computer-aided design (CAD) system to produce basic drawing elements	40	0
MEM30032A	Produce basic engineering drawings	80	0
MEM30033A	Use computer-aided design (CAD) to create and display 3-D models	40	0
MEM50001B	Classify recreational boating technologies and features	54	0
MEM50002B	Work safely on marine craft	12	1
MEM50003B	Follow work procedures to maintain the marine environment	12	1
MEM50004B	Maintain quality of environment by following marina codes	12	1

National Code	National Title	Nominal Hours	Points
MEM50005B	Refuel vessels	36	0
MEM50006B	Check operational capability of marine craft	36	0
MEM50007B	Check operational capability of sails and sail operating equipment	18	0
MEM50008B	Carry out trip preparation and planning	36	0
MEM50009B	Safely operate a mechanically powered recreational boat	18	2
MEM50010B	Respond to boating emergencies and incidents	27	0
MEMPE001A	Use engineering workshop machines	55	0
MEMPE002A	Use electric welding machines	35	0
MEMPE003A	Use oxy-acetylene and soldering equipment	35	0
MEMPE004A	Use fabrication equipment	35	0
MEMPE005A	Develop a career plan for the engineering and manufacturing industry	20	0
MEMPE006A	Undertake a basic engineering project	70	0
MEMPE007A	Pull apart and re-assemble engineering mechanisms	25	0

Qualification Mapping

The following table provides an overview of the qualifications from Version 11 which replaces qualifications from the existing version of the MEM05 Metals and Engineering Training Package

Version 10 Current Qualification				Version 11 Replacement Qualification		
National ID	Title	Hours	E/NE	National ID	Title	Hours
	No previous equivalent			MEM20413	Certificate II in Engineering Pathways	340

Mapping Units of Competency

The following table provides an overview of the units of competency from Version 10 which are replaced by the units of competency from Version 11 of the MEM05 Metals and Engineering Training Package

Version 10 Current Unit				Version 11 Replacement Unit		
National ID	Title	Hours	E/NE	National ID	Title	Hours
	No previous equivalent		-	MEMPE001A	Use engineering workshop machines	55
	No previous equivalent		-	MEMPE002A	Use electric welding machines	35
	No previous equivalent		-	MEMPE003A	Use oxy-acetylene and soldering equipment	35
	No previous equivalent		-	MEMPE004A	Use fabrication equipment	35
	No previous equivalent		-	MEMPE005A	Develop a career plan for the engineering and manufacturing industry	20
	No previous equivalent		-	MEMPE006A	Undertake a basic engineering project	70
	No previous equivalent		-	MEMPE007A	Pull apart and re-assemble engineering mechanisms	25

Traineeships and Apprenticeships

The following table provides a summary of the qualifications in the MEM05 Metals and Engineering Training Package **Version 11** and the accredited traineeships and apprenticeship courses they will replace.

Version 10 Current Qualification				Version 11 Replacement Qualification		
National ID	Title	Traineeship/Apprenticeship	Hours	National ID	Title	Hours
TRAINEESHIPS						
MEM20105	Certificate II in Engineering	Aluminium Windows and Frames Manufacturing (Level 2)	302		No change	
MEM20105	Certificate II in Engineering	Engineering – Production (Level 2)	302		No change	
MEM30105	Certificate III in Engineering – Production Systems	Production Systems (Foundry) (Level 3)	864		No change	
MEM30105	Certificate III in Engineering – Production Systems	Production Systems (General Engineering) (Level 3)	864		No change	
MEM30105	Certificate III in Engineering – Production Systems	Production Systems (Surface Finishing) (Level 3)	864		No change	
MEM30505	Certificate III in Engineering – Technical	Engineering – Technician (Level 3)	864		No change	
MEM40105	Certificate IV in Engineering	Engineering – Higher Engineering Trade (Level 4)	1184		No change	
MEM50105	Diploma of Engineering – Advanced Trade	Engineering (Advanced Trade) (Level 5)	1573		No change	
MEM50212	Diploma of Engineering - Technical	Draftsperson (Level 5)	756		No change	
MEM50212	Diploma of Engineering – Technical	Metallurgical Technician (Level 5)	756		No change	
MEM60112	Advanced Diploma of Engineering	Engineering Assistant (Level 6)	1296		No change	
MEM60112	Advanced Diploma of Engineering	Metallurgical Technician (Advanced) (Level 6)	1296		No change	
APPRENTICESHIPS						
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Engine Reconditioning)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Fitter and Machinist)	864		No change	

Version 10 Current Qualification				Version 11 Replacement Qualification		
National ID	Title	Traineeship/Apprenticeship	Hours	National ID	Title	Hours
APPRENTICESHIPS						
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Machinist – Metal)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Marine Fitter)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Mechanical Fitter)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Metalplating)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Plant Mechanic)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Engineering Tradesperson Mechanical (Refrigeration and Air-conditioning)	864		No change	
MEM30205	Certificate III in Engineering – Mechanical Trade	Toolmaking and Jigmaking (Metal Furniture)	720		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson (Fabrication) (Surface Finishing)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Casting and Moulding)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Heavy)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Heavy/Welding)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Light)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Marine Fitout)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Marine)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Patternmaking)	864		No change	
MEM30305	Certificate III in Engineering – Fabrication Trade	Engineering Tradesperson Fabrication (Welding)	864		No change	
MEM30405	Certificate III in Engineering – Electrical/Electronic Trade	Engineering Tradesperson (Electrical)	864		No change	
MEM30605	Certificate III in Jewellery Making	Jeweller	864		No change	

Version 10 Current Qualification				Version 11 Replacement Qualification		
National ID	Title	Traineeship/Apprenticeship	Hours	National ID	Title	Hours
APPRENTICESHIPS						
MEM30705	Certificate III in Marine Craft Construction	Shipwrighting and Boatbuilding	864		No change	
MEM30805	Certificate III in Locksmithing	Locksmithing	864		No change	
MEM40105	Certificate IV in Engineering	Electrical Instrumentation Tradesperson	1184		No change	