



Stage 6 Syllabus

Metal and Engineering Curriculum Framework

Part A

Course Structures and Requirements

for implementation from 2007

Metal and Engineering (120 indicative hours)
Metal and Engineering (240 indicative hours)
Metal and Engineering Specialisation Study (60 or 120 indicative hours)
Metal and Engineering School-based Apprenticeship (240 indicative hours)
Metal and Engineering School-based Apprenticeship Specialisation
(60 or 120 indicative hours)

2006

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Contents

1	Introduction to Industry Curriculum Frameworks	5
2	Documents Associated with Industry Curriculum Frameworks	6
	2.1 Industry Curriculum Framework documents	6
3	The Higher School Certificate Program of Study	7
4	Vocational Education and Training (VET) in the NSW HSC	8
	4.1 The national context	8
	4.2 Determination of AQF VET qualifications for HSC students	8
5	Rationale	9
6	Aim	10
7	Metal and Engineering Curriculum Framework	11
	7.1 Training Package qualifications	11
	7.2 AQF VET qualifications available in the Metal and Engineering Curriculum Framework	11
8	Course Structures	12
	8.1 Courses within the Metal and Engineering Curriculum Framework	12
	8.1.1 The selection of units of competency	12
	8.2 Allocation of HSC indicative hours of credit	13
	8.3 Unit weight	13
	8.4 Recognition or Prior Learning (RPL) and credit transfer	14
	8.4.1 Recognition of Prior Learning (RPL) and credit transfer within VET courses	14
	8.5 Metal and Engineering (120 indicative hours).....	15
	8.6 Metal and Engineering (240 indicative hours).....	17
	8.7 Metal and Engineering Specialisation Study (60 or 120 indicative hours).....	22
9	Outcomes and Content	26
	9.1 Units of competency	26
	9.2 Course delivery	26
10	Work Placement	28
	10.1 Work placement requirements	28
	10.2 Part-time work	28
11	Assessment Requirements and Advice	29
	11.1 Competency-based assessment	29
	11.2 HSC examination: Metal and Engineering	29
	11.3 Examinable outcomes and content	29
12	HSC Requirements and Certification.....	31
	12.1 Course completion requirements	31
	12.2 Preliminary and HSC unit credit.....	31
	12.3 Reporting achievement in the HSC	31

13	Other Information	32
13.1	Providing for all students.....	32
13.1.1	Students with special education needs.....	32
13.1.2	Gender and cultural considerations.....	33
13.1.3	School-based trainees	33
13.2	Key competencies.....	33
13.3	Articulation to further training.....	34
14	AQF VET Qualifications	35
15	Minimum Requirements for AQF VET Qualifications.....	37
	MEM10105 Certificate I in Engineering	37
	MEM10205 Certificate I in Boating Services.....	40
	MEM20105 Certificate II in Engineering	42
	MEM20205 Certificate II in Engineering – Production Technology.....	47
	MEM20305 Certificate II in Boating Services	54
	MEM30205 Certificate III in Engineering – Mechanical Trade.....	56
	MEM30305 Certificate III in Engineering – Fabrication Trade	61
	MEM30405 Certificate III in Engineering – Electrical/Electronic Trade.....	66
	MEM30505 Certificate III in Engineering – Technical	70
	MEM30605 Certificate III in Jewellery Manufacture.....	72
	MEM30705 Certificate III in Marine Craft Construction.....	75
	Certificate III Trade Specialisation units (for Certificate III qualifications above)	77
	MEM30905 Certificate III in Boating Services	87
	Status of units of competency from the HSC courses for the AQF VET qualifications in the Framework	
	Table 5 Certificates I in Engineering and Boating Services; Certificates II in Engineering, Engineering – Production Technology and Boating Services	89
	Table 6 Certificates III in Engineering – Mechanical Trade, Fabrication Trade, Electrical/Electronic Trade; Jewellery Making and Technical	95
	Table 7 Certificates III in Marine Craft Construction and Boating Services.....	101
16	Glossary	107
17	Metal and Engineering Curriculum Framework School-based Apprenticeship Pathway.....	110
17.1	Metal and Engineering School-based Apprenticeship (240 indicative hours).....	110
17.2	Metal and Engineering School-based Apprenticeship Specialisation (60 or 120 indicative hours)	118

1 Introduction to Industry Curriculum Frameworks

Industry curriculum frameworks give students the opportunity to gain credit towards the NSW Higher School Certificate (HSC) and credit towards national vocational qualifications under the Australian Qualifications Framework (AQF).

Industry curriculum frameworks are based on nationally endorsed Training Packages. They specify the range of industry-developed units of competency from the relevant Training Packages which are suitable for the HSC. They also define how units of competency are arranged in HSC Vocational Education and Training (VET) courses to gain unit credit for the HSC.

This Industry Curriculum Framework document contains the HSC Metal and Engineering VET courses to be delivered for the HSC by schools, TAFE NSW colleges and other Registered Training Organisations (RTOs) on behalf of schools or TAFE NSW colleges.

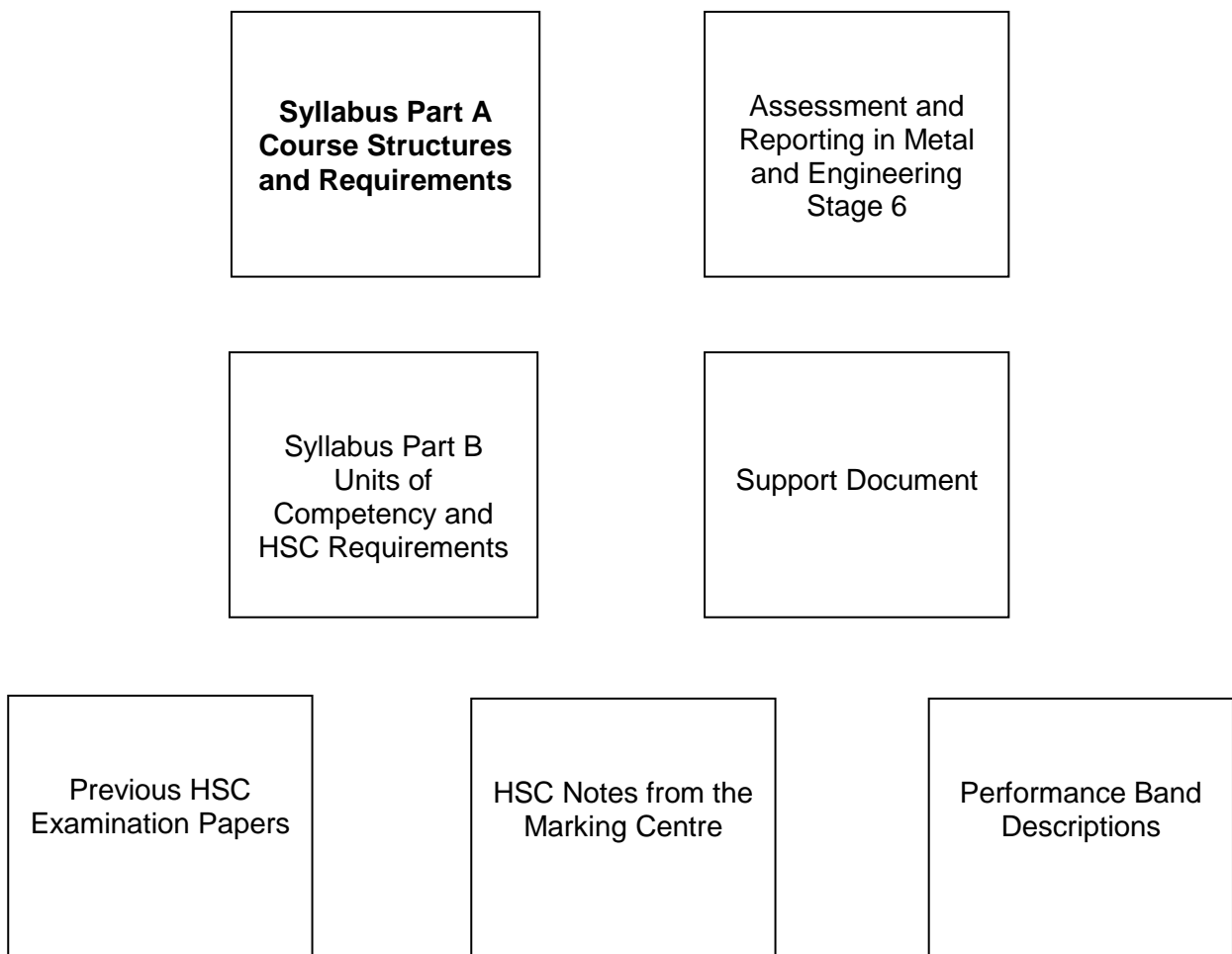
2 Documents Associated with Industry Curriculum Frameworks

The purpose of the industry curriculum framework documents is to assist teachers and trainers to develop teaching and assessment programs, and to help manage competency achievement by HSC candidates.

Part A of the *Metal and Engineering Curriculum Framework Stage 6 Syllabus* describes how students may achieve unit credit towards the HSC and credit towards a vocational qualification. It contains general advice about the Metal and Engineering Curriculum Framework and describes course structures and requirements, including work placement. This document should be used as the first reference when planning to implement courses for the HSC.

The set of documents associated with the Framework is shown below.

2.1 Industry Curriculum Framework documents



3 The Higher School Certificate Program of Study

The purpose of the HSC program of study is to:

- provide a curriculum structure which encourages students to complete secondary education
- foster the intellectual, social and moral development of students, in particular developing their:
 - knowledge, skills, understanding and attitudes in the fields of study they choose
 - capacity to manage their own learning
 - desire to continue learning in formal or informal settings after school
 - capacity to work with others
 - respect for the cultural diversity of Australian society
- provide a flexible structure within which students can prepare for:
 - further education and training
 - employment
 - full and active participation as citizens
- provide formal assessment and certification of students' achievements
- provide a context within which schools also have the opportunity to foster students' physical and spiritual development.

4 Vocational Education and Training (VET) in the NSW HSC

4.1 The national context

VET programs offered for the HSC are consistent with the National Training Framework (NTF). The NTF is the system of vocational education and training that:

- applies nationally
- is made up of the Australian Quality Training Framework (AQTF) and nationally endorsed Training Packages. The AQTF is the agreed quality framework for the national VET system.

The Australian Qualification Framework (AQF) is the policy framework that defines all qualifications recognised nationally in post-compulsory education and training in Australia. HSC VET course qualifications are recognised within the AQF.

4.2 Determination of AQF VET qualifications for HSC students

The HSC VET curriculum frameworks are based on units of competency and qualifications contained in nationally endorsed Training Packages. These AQF VET qualifications are determined by the qualification rules for each Training Package, referred to as *qualification packaging rules*. The qualification packaging rules describe the number and range of units of competency required for eligibility for an AQF VET qualification.

Course structures for the HSC are described in each VET industry curriculum framework syllabus. In order to have satisfactorily completed a framework course, students must follow the course structure, attempt the required units of competency with diligence and sustained effort, and fulfil work placement requirements.

The rules and structure of HSC VET courses are not always identical to the qualification packaging rules. In some cases more units of competency are required for the HSC course than are required for successful completion of the AQF VET qualification.

In some HSC courses, students might not achieve all of the specified units of competency for the purposes of the HSC, but may still be eligible for the qualification as a result of meeting the requirements of the packaging rules for that AQF VET qualification.

Sections 8.5, 8.6 and 8.7 outline the Metal and Engineering course structures within the Metal and Engineering Curriculum Framework.

Section 15 outlines the qualification packaging rules for each AQF VET qualification available through the Metal and Engineering Curriculum Framework (reproduced directly from the Training Package) and should be consulted when selecting elective units of competency.

5 Rationale

The various sectors of the metal and engineering industry comprise about 50% of Australia's manufacturing industry in terms of value-added share. Each sector is involved in the manufacture, service, repair and maintenance of products, tooling and equipment, as well as processes. Engineering installation, repair and maintenance is also applied across most Australian industries. The number of workers across Australian industries who are using engineering and manufacturing-engineering skills is approximately 650,000.¹

The manufacturing and engineering industry is the second largest employer in Australia. There are a wide range of industry sectors and jobs within the industry. Enterprise sizes range from many small businesses of a few employees to large enterprises. The industry has been actively reshaping itself over the last decade, embracing new technologies, innovation and more efficient production practices and becoming increasingly export-focused.²

The growth of the boating industry is set to increase even more strongly over the next decade as more Australians increase their leisure time and recreational activities. Careers in the industry may be found in boat sales, marina and slipway operations, boat servicing, sailmaking, mechanical repairs, charter operations, retail and boat building.³

The Metal and Engineering Training Package (MEM05) offers qualifications from Certificate I to Advanced Diploma and specifies the competencies required for various specialised occupations. These include mechanical, fabrication, and electrical/electronic trade; production technology and production systems; jewellery manufacture; locksmithing; boating services; and marine craft construction. The Metal and Engineering Curriculum Framework is based on units of competency from this Training Package.

The inclusion of courses in metal and engineering in the HSC based on industry-recognised AQF VET qualifications will allow students to access both long-term and short-term employment opportunities. Courses within the Metal and Engineering Curriculum Framework provide an opportunity for students to gain Certificates I, II and/or Statement of Attainment towards Certificate III as part of their HSC. Apart from being nationally recognised, these AQF VET qualifications articulate into higher-level qualifications including traineeships and apprenticeships in the manufacturing, engineering and related services industries which students may pursue post-school.

The Framework also provides an optional HSC examination, which allows results from the Metal and Engineering (240 indicative hours) course to contribute to the calculation of the Australian Tertiary Admission Rank (ATAR).

Learning in each HSC Metal and Engineering course within the Framework provides opportunities for students to develop relevant technical, vocational and interpersonal competencies suitable for employment and further training in manufacturing, engineering and related services industries. It also provides skills, knowledge and experiences – such as teamwork, communication and occupational health and safety – that are transferable to other industry areas.

¹ DEST, 2005, *Metal and Engineering Training Package (MEM05)*, Volume 1, Introduction, p 8.

^{2,3} www.mskills.com.au and www.mersitab.com.au

6 Aim

The Metal and Engineering Curriculum Framework is designed to enable students to acquire a range of technical, practical, personal and organisational skills valued both within and beyond the workplace. They will also acquire underpinning knowledge and skills related to work, employment and further training within the manufacturing, engineering and related services industries. Through the study of this subject, students will gain experiences that can be applied to a range of contexts, including work, study and leisure and that will assist them to make informed career choices.

7 Metal and Engineering Curriculum Framework

7.1 Training Package qualifications

The Metal and Engineering Curriculum Framework is based on the national Metal and Engineering Training Package (MEM05).

The Metal and Engineering Training Package incorporates six nationally recognised qualification levels ranging from AQF Certificate I in Engineering to an Advanced Diploma of Engineering.

7.2 AQF VET qualifications available in the Metal and Engineering Curriculum Framework

The AQF VET qualifications available in the Metal and Engineering Curriculum Framework are listed in Table 1 below. Section 15 of this document outlines the qualification packaging rules for the qualifications available through the courses within the Framework.

A Statement of Attainment will be issued for achievement of single or multiple units of competency. At a later date, a person can undertake further skill development or training and be assessed against additional competencies until they have achieved all the competencies required for an AQF VET qualification. RTOs must recognise and give credit for the competencies recorded on a Statement of Attainment.

Table 1

Qualifications available within the Metal and Engineering Training Package (MEM05)		Qualifications available within the Metal and Engineering Curriculum Framework	
<i>National code</i>	<i>Qualification name</i>	<i>Certificate</i>	<i>Statement of Attainment</i>
MEM10105	Certificate I in Engineering	✓	✓
MEM10205	Certificate I in Boating Services	✓	✓
MEM20105	Certificate II in Engineering	✓	✓
MEM20205	Certificate II in Engineering – Production Technology	-	✓
MEM20305	Certificate II in Boating Services	✓	✓
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	-	✓
MEM30505	Certificate III in Engineering – Technical	-	✓
MEM30605	Certificate III in Jewellery Manufacture	-	✓
MEM30705	Certificate III in Marine Craft Construction	-	✓
MEM30805	Certificate III in Locksmithing	-	-
MEM30905	Certificate III in Boating Services	✓	✓
MEM40105	Certificate IV in Engineering	-	-
MEM40205	Certificate IV in Boating Services	-	-
MEM50105	Diploma of Engineering – Advanced Trade	-	-
MEM50205	Diploma of Engineering – Technical	-	-
MEM60105	Advanced Diploma of Engineering	-	-

8 Course Structures

8.1 Courses within the Metal and Engineering Curriculum Framework

An industry curriculum framework describes the units of competency that have been identified as being suitable for the purposes of the HSC. Units of competency in the Metal and Engineering Curriculum Framework are detailed in **Sections 8.5, 8.6 and 8.7**.

Each course in a framework describes how the available units of competency can be grouped to gain units of credit towards the HSC.

The Metal and Engineering Curriculum Framework contains the following courses:

- Metal and Engineering (120 indicative hours)
- Metal and Engineering (240 indicative hours)
- Metal and Engineering Specialisation Study (60 or 120 indicative hours).

The maximum number of Preliminary and/or HSC units available from this Framework is six units. That is, courses can total up to 360 hours. In addition to courses within the Framework students may undertake locally designed Board Endorsed VET courses drawing from the Metal and Engineering Training Package (MEM05). Such courses may provide additional HSC credit for students.

Compulsory units of competency are those that all students must attempt in their study of the HSC course (refer to Section 8, Tables 2 and 3). **Mandatory** units of competency are those required by the Metal and Engineering Training Package for a student to be eligible for the vocational qualification (refer to Section 15).

8.1.1 The selection of units of competency

Units of competency should be selected within course structures to maximise students' eligibility for AQF VET qualifications. **Section 15** provides the qualification packaging rules for the qualification available through the Metal and Engineering Curriculum Framework (reproduced directly from the Training Package). **Tables 5–7** (pp 89–106) lists the status of each unit of competency in relation to the qualifications. This information should be consulted when selecting elective units of competency.

An integrated or holistic approach to course delivery should be adopted. Examples of integrated approaches to programming and assessment strategies, as well as advice on curriculum materials that may be used to support the delivery of courses within the Metal and Engineering Curriculum Framework, are contained in the *Metal and Engineering Curriculum Framework Support Document* (www.boardofstudies.nsw.edu.au). This information is provided as a guide to RTOs delivering HSC courses within the Framework.

8.2 Allocation of HSC indicative hours of credit

Units of competency drawn from Training Packages are not defined in terms of duration. The amount of time required by individual students to achieve competency will vary according to their aptitude and experience. Where a training program is designed for delivery by an RTO, the RTO will specify the length of the training program according to the delivery strategies/ curriculum resources chosen.

However, for the purposes of the HSC, courses must be described in terms of their indicative hours. For this reason, indicative hours for unit credit towards the HSC have been assigned to each unit of competency within the Framework. It is emphasised that the assignment of indicative hours does not imply that all students will fulfil all requirements of a unit of competency within these hours. RTOs may determine that additional or fewer hours are required for the achievement of particular competencies. However, this does not alter the indicative hours allocated, only the delivery hours. It is also expected that students will need to spend additional time practising skills in a work environment and in completing projects and assignments, in order to fulfil Training Package assessment requirements.

Tables 2, 3 and 4 (Section 8) list the indicative hours assigned to each unit of competency included in the Metal and Engineering Curriculum Framework for the purpose of unit credit towards the HSC.

8.3 Unit weight

Many units of competency have an allocated weight shown as ‘unit weight’. This weighting is usually referred to as the ‘points’.

The points reflect the industrial ‘value’ placed on units of competency for classification under the *Metal Engineering and Associated Industries Award 1998*. Combinations of units of competency representative of a work role result in a total points weighting. This is then used to identify the correct classification level for the work.

The unit weightings do not represent hours of training, directly or by formula.

The unit weight or ‘points’ allocated to each unit of competency within the Metal and Engineering Curriculum Framework is stated in Sections 8.5, 8.6 and 8.7 of this document. For units of competency in the Metal and Engineering (120 and 240 indicative hours) courses, this information is also provided in Part B of the Syllabus.

These weightings are used in the packaging rules for some of the qualifications. The units of competency selected for the qualification must have a combined points value no less than the points value specified for each component of the qualification (refer to Section 15 of this document).

These combined points totals also include the points for any prerequisite units involved. **Note that the points for any particular unit can only be counted once in each qualification.** For example, if a unit is selected to be part of a qualification and it is also a prerequisite for another selected unit, then the points for that unit can only be counted once.

8.4 Recognition of Prior Learning (RPL) and credit transfer

Recognition of Prior Learning (RPL) and credit transfer refer to the acknowledgement of evidence of a student's achievement of competencies or learning outcomes. They are processes that allow students to have their previous learning – both formal and informal – count towards their HSC VET courses and AQF VET qualifications.

RPL is an assessment process that assesses the individual student's non-formal and informal learning to determine the extent to which that individual has achieved the competency standards. **Where the outcomes of this process indicate that the student is competent, structured training is not required.**

Credit transfer is a process that provides credit for a unit of competency previously achieved. **Students should be given recognition for units of competency already held. Structured training or assessment for these units is not required.**

The RPL requirements of the AQTF and the Board of Studies must be met.

8.4.1 Recognition of Prior Learning (RPL) and credit transfer within VET courses

Students undertaking HSC courses within the Metal and Engineering Curriculum Framework may already hold units of competency or have current knowledge, skills and experience relevant to the units of competency within the courses.

Students can be granted credit (recognition of prior learning or credit transfer) for:

- units of competency within AQF VET qualifications
- HSC VET course outcomes and content as defined by the indicative hour requirements of HSC VET courses
- mandatory work placement requirements.

Further information about the arrangements for RPL and credit transfer within VET courses, including processes, application forms and examples of possible scenarios, is available on the Board's website at www.boardofstudies.nsw.edu.au/voc_ed/rpl.html

8.5 Metal and Engineering (120 indicative hours)

Purpose

The purpose of this course is to provide students with an opportunity to develop basic knowledge and skills in manufacturing, engineering and related services industries.

Course structure

This course comprises four compulsory units of competency and the manufacturing, engineering and related services industries induction.

Section 15 outlines the qualification packaging rules for each qualification available through the Metal and Engineering Curriculum Framework. Tables 5–7 (pp 89–106) list the status of each unit of competency in relation to the qualifications. This section should guide the selection of units of competency to meet qualification requirements. It is recommended that the combination of units of competency should be chosen to focus on an occupational outcome.

120 indicative hour courses are accredited for a total of two units at the Preliminary and/or HSC level.

Course requirements

- Students must attempt:
 - **ALL** compulsory units of competency
 - **AND** the manufacturing, engineering and related services industries induction
 - **PLUS** a selection of elective units of competency from the 240 indicative hour course which have not already been undertaken to a minimum value of 65 indicative hours.
- Students must complete a minimum of 35 hours of mandatory work placement.
- The learning experiences for the HSC in MEM13014A *Apply principles of occupational health and safety in the work environment* must be undertaken prior to work placement.

Table 2 Metal and Engineering (120 indicative hours)

COMPULSORY Attempt ALL units				
Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
N/A	Manufacturing, engineering and related services industries induction	–	–	10
MEM13014A	Apply principles of occupational health and safety in the work environment ⁴	–	Nil	15
MEM14004A	Plan to undertake a routine task	–	Nil	10
MEM15024A	Apply quality procedures	–	Nil	5
MEM16007A	Work with others in a manufacturing, engineering or related environment	–	Nil	15

ELECTIVE UNITS Attempt units to a minimum value of 65 indicative hours

Elective units may include any unit from the 240 indicative hour course which has not already been undertaken (refer to Section 8.6, Table 3).

⁴ Learning experiences for the HSC for this unit of competency must be undertaken prior to work placement.

Depending on the selection and achievement of units of competency, the possible qualification outcome is:

- Statement of Attainment towards Certificate I in Engineering (MEM10105)
- Certificate I in Boating Services (MEM10205)
- Statement of Attainment towards Certificate II in Engineering (MEM20105)
- Statement of Attainment towards Certificate II in Engineering – Production Technology (MEM20205)
- Statement of Attainment towards Certificate II in Boating Services (MEM20305).

AQF VET qualifications

To receive AQF VET qualifications, students must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

Qualification packaging rules are in Section 15 of this document.

Further information on assessment is in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.

8.6 Metal and Engineering (240 indicative hours)

Purpose

The purpose of this course is to provide students with the opportunity to gain a range of skills and knowledge suitable for employment in manufacturing, engineering and related services industries.

Course structure

This course comprises 10 compulsory units of competency, the manufacturing, engineering and related services industries induction and an elective pool containing 34 units of competency.

Section 15 outlines the qualification packaging rules for each qualification available through the Metal and Engineering Curriculum Framework. Tables 5–7 (pp 89–106) list the status of each unit of competency in relation to the qualifications. This section should guide the selection of units of competency to meet qualification requirements. It is recommended that the combination of units of competency should be chosen to focus on an occupational outcome.

240 indicative hour courses are accredited for a total of four units at the Preliminary and/or HSC level.

Course requirements

- Students must attempt:
 - **ALL** compulsory units of competency
 - **AND** the manufacturing, engineering and related services industries induction
 - **PLUS** a selection of units of competency from the elective pool to a minimum value of 70 indicative hours.
- Students must complete a minimum of 70 hours of mandatory work placement.
- The learning experiences for the HSC in MEM13014A *Apply principles of occupational health and safety in the work environment* must be undertaken prior to work placement.

An external written Higher School Certificate examination will be conducted for this course. This examination is optional. In the year they will complete the course, students will specify whether or not they choose to undertake the external written examination (refer to Sections 11.2 and 11.3).

Table 3 Metal and Engineering (240 indicative hours)

COMPULSORY Attempt ALL units				
Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
N/A	Manufacturing, engineering and related services industries induction	–	–	10
MEM09002B	Interpret technical drawing	4	Nil	30
MEM12023A	Perform engineering measurements	5	Nil	15
MEM12024A	Perform computations	3	Nil	20
MEM13014A	Apply principles of occupational health and safety in the work environment ⁵	–	Nil	15
MEM14004A	Plan to undertake a routine task	–	Nil	10
MEM15002A	Apply quality systems	2	Nil	10
MEM15024A	Apply quality procedures	–	Nil	5
MEM16007A	Work with others in a manufacturing, engineering or related environment	–	Nil	15
MEM18001C	Use hand tools	2	Nil	20
MEM18002B	Use power tools/hand held operations	2	Nil	20

⁵ Learning experiences for the HSC for this unit of competency must be undertaken prior to work placement.

Table 3 (cont/d)

ELECTIVE POOL Attempt units to a minimum value of 70 indicative hours				
Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
Assembly				
MEM03001B	Perform manual production assembly	4	Nil	35
MEM03003B	Perform sheet and plate assembly	4	MEM18001C MEM18002B	35
Casting and moulding				
MEM04018B	Perform general woodworking machine operations	4	MEM12023A MEM18001C	15
Fabrication				
MEM05003B	Perform soft soldering	2	Nil	15
MEM05004C	Perform routine oxy acetylene welding	2	Nil	15
MEM05005B	Carry out mechanical cutting	2	MEM12023A MEM18001C	5
MEM05006B	Perform brazing and/or silver soldering	2	Nil	20
MEM05007C	Perform manual heating and thermal cutting	2	Nil	10
MEM05012C	Perform routine manual metal arc welding	2	Nil	20
MEM05049B	Perform routine gas tungsten arc welding	2	Nil	20
MEM05050B	Perform routine gas metal arc welding	2	Nil	20
MEM05051A	Select welding processes	2	Nil	10
MEM05052A	Apply safe welding practices	4	Nil	10
Machine and process operations				
MEM07032B	Use workshop machines for basic operations	2	MEM18001C	25
Materials handling				
MEM11011B	Undertake manual handling	2	Nil	5
Measurement				
MEM12001B	Use comparison and basic measuring devices	2	Nil	10
MEM12006C	Mark off/out (general engineering)	4	MEM09002B MEM12023A	25
Occupational health and safety				
MEM13001B	Perform emergency first aid	1	Nil	10
MEM13003B	Work safely with industrial chemicals and materials	2	Nil	10

Table 3 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
Communication				
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2	Nil	10
MEM16006A	Organise and communicate information	2	Nil	15
MEM16008A	Interact with computing technology	2	Nil	10
Maintenance and diagnostics				
MEM18003C	Use tools for precision work	4	MEM12023A MEM18001C MEM18002B	15
MEM18055B	Dismantle, replace and assemble engineering components	3	MEM09002B MEM12023A MEM18001C MEM18002B	30
Jewellery and horological				
MEM19002B	Prepare jewellery illustrations	4	MEM16006A	30
MEM19006B	Replace watch batteries	1	MEM18001C	10
MEM19012B	Produce jewellery wax model	4	MEM12023A MEM18001C MEM18002B MEM18003C	30
MEM19015B	Perform jewellery enamelling	4	MEM13003B MEM18001C	35
Marine craft construction				
MEM25001B	Apply fibre-reinforced materials	2	MEM13003B MEM18001C MEM18002B	20
MEM25004B	Fair and shape surfaces	2	MEM13003B MEM18001C MEM18002B	30
MEM25007B	Maintain marine vessel surfaces	4	MEM13003B MEM18001C MEM18002B	30
Boating services				
MEM50001B	Classify recreational boating technologies and features	0	Nil	20
MEM50002B	Work safely on marine craft	1	Nil	15
MEM50003B	Follow work procedures to maintain the marine environment	1	Nil	10

Depending on the selection and achievement of units of competency, the possible qualification outcome is:

- Certificate I in Engineering (MEM10105)
- Certificate I in Boating Services (MEM10205)
- Certificate II in Engineering (MEM20105)
- Statement of Attainment towards Certificate II in Engineering – Production Technology (MEM20205)
- Certificate II in Boating Services (MEM20305)
- Statement of Attainment towards Certificate III in Engineering – Mechanical Trade (MEM30205)
- Statement of Attainment towards Certificate III in Engineering – Fabrication Trade (MEM30305)
- Statement of Attainment towards Certificate III in Engineering – Electrical/Electronic Trade (MEM30405)
- Statement of Attainment towards Certificate III in Jewellery Manufacture (MEM30605)
- Statement of Attainment towards Certificate III in Marine Craft Construction (MEM30705).

AQF VET qualifications

To receive AQF VET qualifications, students must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

Qualification packaging rules are in Section 15 of this document.

Further information on assessment is in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.

8.7 Metal and Engineering Specialisation Study (60 or 120 indicative hours)

Purpose

The purpose of the Specialisation Study is to provide students with the opportunity to gain further credit towards Certificate II and III qualifications within manufacturing, engineering and related services industries. It is available to all students undertaking the Metal and Engineering (240 indicative hours) course but is intended specifically for students with particular interest in, and aptitude for, the industry.

The maximum number of Preliminary and/or HSC units available from this Framework is six units. That is, courses can total up to 360 hours. In addition to courses within the Framework students may undertake locally designed Board Endorsed VET courses drawing from the Metal and Engineering Training Package (MEM05). Such courses may provide additional HSC credit for students.

Before offering the Specialisation Study, schools should ensure that the RTO undertaking delivery has the scope to deliver the relevant qualification or units of competency.

Course structure

The Specialisation Study can consist of units of competency drawn from the Metal and Engineering (240 indicative hours) course not previously attempted by students **AND/OR** from the pool of 27 Specialisation Study units of competency listed in Table 4.

Details of the units of competency listed in Table 4 are not included in Part B of the Syllabus. They are available in the Metal and Engineering Training Package (MEM05) or at www.ntis.gov.au

Section 15 provides the qualification packaging rules for the qualifications available through the Metal and Engineering Curriculum Framework. Tables 5–7 (pp 89–106) list the status of each unit of competency in relation to the qualifications. This section should guide the selection of units of competency to meet qualification requirements. It is recommended that the combination of units of competency should be chosen to focus on an occupational outcome.

The Specialisation Study (60 indicative hours) course is accredited for a total of one unit at the Preliminary or HSC level. The Specialisation Study (120 indicative hours) course is accredited for a total of two units at the Preliminary and/or HSC level.

Course requirements

Students may only undertake a Specialisation Study if they are currently enrolled in, or have completed, the Metal and Engineering (240 indicative hours) course.

Specialisation Study (60 indicative hours) course:

- Units should be selected to a minimum of 60 indicative hours.
- Students must complete a minimum of 14 *additional* hours of mandatory work placement.

Specialisation Study (120 indicative hours) course:

- Units should be selected to a minimum of 120 indicative hours.
- Students must complete a minimum of 35 *additional* hours of mandatory work placement.

Table 4 Specialisation Study units of competency

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
Fabrication				
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4	Nil	20
Forging				
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2	Nil	20
Machine and process operations				
MEM07003B	Perform machine setting (routine)	4	MEM07024B MEM12023A MEM16006A MEM18001C	50
MEM07005C	Perform general machining	8	MEM09002B MEM12023A MEM18001C	50
MEM07024B	Operate and monitor machine/process	4	Nil	30
MEM07028B	Operate computer controlled machine/processes	2	MEM07024B	40
Surface finishing				
MEM08010B	Manually finish/polish materials	6	MEM18001C	15
Drawing, drafting and design				
MEM09003B	Prepare basic engineering drawing	8	MEM09002B	30
Measurement				
MEM12007D	Mark off/out structural fabrications and shapes	4	MEM12023A	30
Occupational health and safety				
MEM13004B	Work safely with molten metals/glass	2	Nil	25
Quality				
MEM15001B	Perform basic statistical quality control	2	Nil	30
MEM15003B	Use improvement processes in team activities	4	MEM16007A	15

Table 4 cont/d

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
Jewellery and horological				
MEM19001B	Perform jewellery metal casting	6	MEM13004B	30
MEM19014B	Perform hand engraving	4	MEM18001C	20
MEM19016B	Construct jewellery components	4	MEM05006B MEM12023A MEM18001C	30
MEM19017B	Fabricate jewellery items	6	MEM05006B MEM06007B MEM12023A MEM18001C	50
Marine craft construction				
MEM25002B	Form and integrate fibre-reinforced structures	4	MEM13003B MEM18001C MEM18002B	30
MEM25006B	Undertake marine sheathing operations	2	MEM13003B MEM18001C MEM18002B MEM25004B	15
Engineering technician				
MEM30001A	Use computer aided drafting systems to produce basic engineering drawings	Nil	MEM16006A MEM16008A	50
MEM30002A	Produce basic engineering graphics	Nil	MEM16006A MEM16008A	30
Boating services				
MEM50004B	Maintain quality of environment by following marina codes	1	MEM50003B	10
MEM50005B	Refuel vessels	0	MEM50002B MEM50003B	10
MEM50006B	Check operational capability of marine craft	0	MEM50002B	15
MEM50007B	Check operational capability of sails and sail operating equipment	0	MEM50002B	15
MEM50008B	Carry out trip preparation and planning	0	Nil	15
MEM50009B	Safely operate a mechanically powered recreational boat	2	Nil	20
MEM50010B	Respond to boating emergencies and incidents	0	Nil	15

Depending on the selection and achievement of units of competency, the possible qualification outcome is:

- Certificate I in Boating Services (MEM10205)
- Certificate II in Engineering (MEM20105)
- Statement of Attainment towards Certificate II in Engineering – Production Technology (MEM20205)
- Certificate II in Boating Services (MEM20305)
- Statement of Attainment towards Certificate III in Engineering – Mechanical Trade (MEM30205)
- Statement of Attainment towards Certificate III in Engineering – Fabrication Trade (MEM30305)
- Statement of Attainment towards Certificate III in Engineering – Electrical/Electronic Trade (MEM30405)
- Statement of Attainment towards Certificate III in Engineering – Technical (MEM30505)
- Statement of Attainment towards Certificate III in Jewellery Manufacture (MEM30605)
- Statement of Attainment towards Certificate III in Marine Craft Construction (MEM30705)
- Certificate III in Boating Services (MEM30905).

AQF VET qualifications

To receive AQF VET qualifications, students must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

Qualification packaging rules are in Section 15 of this document.

Further information on assessment is in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.

9 Outcomes and Content

9.1 Units of competency

Details about individual units of competency in the Metal and Engineering (240 indicative hours) course for the HSC in the Metal and Engineering Curriculum Framework are contained in Part B of this Syllabus. Part B details unit of competency content and HSC requirements and advice.

The text for each unit of competency in the Metal and Engineering Curriculum Framework is reproduced directly from the Metal and Engineering Training Package (MEM05). Each unit of competency consists of:

- elements of competency
- performance criteria
- a range statement
- an evidence guide, including:
 - overview of assessment requirements
 - context of assessment
 - interdependent assessment
 - method of assessment
 - consistency of performance
 - required skills
 - required knowledge.

In addition, there is a column headed *HSC Requirements and Advice* that prescribes the scope of learning and the minimum learning experiences expected for each unit of competency for the purposes of the HSC. These must be addressed by all students studying the Metal and Engineering (120 and 240 indicative hours) courses.

The units of competency to be delivered and assessed are determined by the scope of the registration of each RTO. Teachers and trainers should check their RTO's scope of registration before determining which units of competency are to be included in their teaching and assessment programs. School principals should seek documentary evidence of the scope of any external RTO delivering the HSC course. Scope of registration can be checked on the National Training Information Services (NTIS) website (www.ntis.gov.au).

Information about the delivery of VET courses for the HSC by RTOs other than schools or TAFE NSW colleges are contained in the Board of Studies *Assessment, Certification and Examination (ACE) Manual* and relevant Board of Studies Official Notices.

9.2 Course delivery

RTOs offering training programs that deliver HSC Metal and Engineering Framework courses must consult Part B of this Syllabus and take into consideration the details provided in the *HSC Requirements and Advice* column (including key terms and concepts) as well as the following requirements for each unit of competency:

- the elements of competency
- the performance criteria
- the range statement
- all aspects of the evidence guide.

RTOs should pay particular attention to the information under *Prerequisites* (to ensure these requirements have been met), *Required skills* and *Required knowledge*.

The *HSC Requirements and Advice* column prescribes what learning experiences **must** be included for the HSC. The range statement frequently makes reference to ‘may include’. In the examinable units of competency this has been clarified, in the HSC Requirements and Advice column, to prescribe what learning experiences must be included for the HSC.

It is the responsibility of the RTO to determine both the resources required for course delivery, and the AQF VET qualifications that must be held by teachers and trainers delivering courses within the Metal and Engineering Curriculum Framework on behalf of the RTO.

Separate advice on learning materials, resource requirements and teacher qualifications is available from school systems/sector authorities.

Further advice on curriculum materials that may be used to support the delivery of courses within the Metal and Engineering Curriculum Framework is contained in the *Metal and Engineering Support Document* (www.boardofstudies.nsw.edu.au). This information is provided as a guide to RTOs delivering HSC courses within the Framework.

10 Work Placement

Work placement is a mandatory HSC requirement within this Framework and appropriate hours have been assigned to each course.

Learning in the workplace will enable students to:

- progress towards the achievement of industry competencies
- develop appropriate attitudes towards work
- learn a range of behaviours appropriate to the industry
- practise skills acquired in the classroom or workshop
- develop additional skills and knowledge, including the key competencies (refer to Section 13.2, p33).

The mandatory work placement requirements for courses in this Framework are not intended to indicate the time required for the achievement of units of competency. The amount of learning in the workplace that is needed to achieve a unit of competency will vary from student to student. Assessment of the units of competency is to be undertaken by qualified assessor(s) either in a work placement setting or in the classroom.

10.1 Work placement requirements

Students must complete the following work placement for Metal and Engineering courses:

- Metal and Engineering (120 indicative hours) – a minimum of 35 hours in a workplace
- Metal and Engineering (240 indicative hours) – a minimum of 70 hours in a workplace
- Metal and Engineering Specialisation Study (60 indicative hours) – a minimum of 14 *additional* hours in a workplace
- Metal and Engineering Specialisation Study (120 indicative hours) – a minimum of 35 *additional* hours in a workplace
- Metal and Engineering School-based Apprenticeship (240 indicative hours) – mandatory work placement hour requirements for this course are met through the on-the-job training component of the school-based apprenticeship
- Metal and Engineering School-based Apprenticeship Specialisation (60 or 120 indicative hours) – mandatory work placement hour requirements for this course are met through the on-the-job training component of the school-based apprenticeship.

Non-completion of work placement is grounds for the withholding of the course. Schools are advised to follow the issuing of ‘N’ determinations as outlined in the Board of Studies *Assessment, Certification and Examinations (ACE) Manual*.

It is the responsibility of the school and/or other RTO to determine how course outcomes are best achieved and to structure delivery accordingly. If additional work placement or classroom time is required to enable individual students or class groups to achieve the competencies, this will be determined by the deliverer, but it does not affect the indicative HSC hours.

Further information and advice on the implementation of work placement are contained in policy statements or guidelines available from the relevant school system/sectors authority or the RTO.

10.2 Part-time work

Under some circumstances, students’ part-time work in an appropriate workplace may be used to fulfil work placement requirements. For further details, teachers and principals should consult the Board of Studies *Assessment, Certification and Examinations (ACE) Manual* or relevant Board of Studies Official Notices.

11 Assessment Requirements and Advice

11.1 Competency-based assessment

The VET courses within the Metal and Engineering Curriculum Framework are competency-based. Advice on appropriate assessment practice in relation to the Metal and Engineering Curriculum Framework is contained in the *Assessment and Reporting in Metal and Engineering Stage 6* document.

This document, as well as other resources and advice related to assessment in Metal and Engineering Stage 6, is available at the Board's website at http://www.boardofstudies.nsw.edu.au/syllabus_hsc/metal-engineering.html

11.2 HSC examination: Metal and Engineering

The HSC examination in Metal and Engineering is optional. Only students who have completed the Metal and Engineering (240 indicative hours) or Metal and Engineering School-based Apprenticeship (240 indicative hours) course are eligible to sit for the HSC examination. Students who undertake the examination can have their HSC mark contribute to their ATAR.

The HSC examination specifications, which describe the format of the external HSC examination, are contained in the *Assessment and Reporting in Metal and Engineering Stage 6* document.

The HSC examination is independent of the competency-based assessment undertaken during the course and has no impact on student eligibility for AQF VET qualifications.

11.3 Examinable outcomes and content

The HSC examination in Metal and Engineering is based on a set of examinable units of competency from the Metal and Engineering (240 indicative hours) and Metal and Engineering School-based Apprenticeship (240 indicative hours) course and the associated key competencies.

The HSC examination is based on the following components of each examinable unit of competency:

- elements of competency
- performance criteria
- range statement⁶
- evidence guide, including:
 - overview of assessment requirements
 - context of assessment
 - interdependent assessment
 - method of assessment

⁶ The range statement frequently uses the term 'may include'. This has been clarified in the *HSC Requirements and Advice* column to specify the learning experiences that must be included for the examinable units of competency. Only the learning that is compulsory according to the Training Package and/or *HSC Requirements and Advice* can be examined.

- consistency of performance
- required skills
- required knowledge
- minimum prescribed learning contained in HSC requirements and advice, described as:
 - key terms and concepts, and
 - learning experiences that must be addressed for the HSC.

The examinable units of competency are:

Unit code	Unit title
N/A	Manufacturing, engineering and related services industries induction
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations

The text of the examinable units of competency, including the HSC requirements and advice, is contained in the *Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part B*.

12 HSC Requirements and Certification

12.1 Course completion requirements

For a student to be considered to have satisfactorily completed a course within the Metal and Engineering Curriculum Framework there must be sufficient evidence that the student has:

- followed the course developed by the Board
- applied themselves with diligence and sustained effort to the set tasks and experiences provided in the course by the school/RTO
- achieved some or all of the course outcomes
- undertaken the mandatory work placement.

Refer the Board's [Assessment, Certification and Examination \(ACE\) Manual](#) for further information.

12.2 Preliminary and HSC unit credit

To facilitate flexibility of VET in the HSC, courses within the Metal and Engineering Curriculum Framework may be delivered as Preliminary units, as HSC units or as a combination of Preliminary and HSC units.

12.3 Reporting achievement in HSC

Advice on reporting achievement in relation to the Metal and Engineering Curriculum Framework is contained in the *Assessment and Reporting in Metal and Engineering Stage 6* document.

This document is available at the Board's website at http://www.boardofstudies.nsw.edu.au/syllabus_hsc/metal-engineering.html

13 Other Information

13.1 Providing for all students

13.1.1 Students with special education needs

Courses in the Metal and Engineering Curriculum Framework are available to all students.

Students with special education needs may access:

- all courses within the Metal and Engineering Curriculum Framework under regular course arrangements

OR

- units of competency selected through the individual transition-planning process from the relevant course units of competency detailed in Sections 8.5 and 8.6 of this document.

The latter option recognises that students with special education needs may require additional time to demonstrate the required level of competence.

The appropriate units of competency will be selected through the individual transition-planning process and should be directed towards the achievement of an AQF VET Certificate and an occupational outcome.

It is recommended that individual transition planning should prioritise the compulsory units of competency as they provide essential foundation skills for employment in the manufacturing, engineering and related services industries. Additional units of competency should then be selected according to the identified individual needs of the student.

Successful participation in courses within the Metal and Engineering Curriculum Framework for students with special education needs will require:

- transition planning to meet individual needs
- prevocational preparation
- appropriate methods for course delivery and assessment
- ongoing partnerships between schools, students, parents, teachers, employers and others in the community.

To develop skills and knowledge to industry standard, students with special education needs may require extended time and additional support off the job and in the workplace.

Further advice on the implementation of the Metal and Engineering Curriculum Framework for students with special education needs is contained in the *Stage 6 Industry Curriculum Frameworks Support Document for Students with Special Education Needs (2005)*. This document is available on the Board of Studies website (www.boardofstudies.nsw.edu.au).

Work placement

Students with special education needs **must** undertake the minimum work placement requirements for courses within the Metal and Engineering Curriculum Framework, detailed in the course requirements for each course and in Section 10 of this document.

Assessment

Students with special education needs are subject to the assessment requirements detailed in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.

AQF VET qualifications

Eligibility for AQF VET qualifications is the same for all students. To receive AQF VET qualifications, students with special education needs must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

13.1.2 Gender and cultural considerations

Industry curriculum frameworks have been developed to address the needs of a broad range of students. Teaching and assessment programs in the Metal and Engineering Curriculum Framework should be developed to minimise any gender or cultural bias. Case studies, illustrative examples and other materials used for teaching and assessment should be selected on the basis that they do not reinforce gender or cultural stereotypes.

13.1.3 School-based trainees

The Metal and Engineering Curriculum Framework includes provision for trainees to fulfil their requirements and gain an AQF VET qualification.

Trainees who are seeking credit towards the Higher School Certificate for their training should undertake the Metal and Engineering (240 indicative hours) course. In addition, students may undertake a 60 or 120 indicative hour Specialisation Study. Additional HSC credit is available through the locally designed Board Endorsed Course process. Such courses may draw from units of competency in the Metal and Engineering Training Package (MEM05) and can be tailored/customised to align to a student's training plan as included in their Vocational Training Order (VTO).

Further information on requirements and arrangements for school-based traineeships in the area of metal, engineering and related services industries is available from:

- school system/sector authorities
- the Department of Education and Training State Training Centres
- the apprenticeships and traineeships website (<http://apprenticeship.det.nsw.edu.au>)
- New Apprenticeship Centres.

13.2 Key competencies

The *key competencies* are competencies considered essential for effective participation in the emerging patterns of work and work organisations as well as in life generally. They focus on the capacity to apply knowledge and skills in an integrated way in work situations. Key competencies are generic in that they apply to work generally, rather than being specific to particular occupations or industries.

The key competencies are:

- collecting, organising and analysing information
- communicating ideas and information
- planning and organising activities

- working with others and in teams
- solving problems
- using mathematical ideas and techniques
- using technology.

Each unit of competency in this Industry Curriculum Framework identifies the relationship between the unit and the key competencies. This relationship is represented by performance levels 1, 2 and 3. The following provides a brief description of the performance levels.

Performance Level 1 describes the competence needed to undertake activities efficiently and with sufficient self-management to meet the explicit requirements of the activity and to make judgements about quality of outcome against established criteria.

Performance Level 2 describes the competence needed to manage activities requiring the selection, application and integration of a number of elements, and to select from established criteria to judge quality of process and outcome.

Performance Level 3 describes the competence needed to evaluate and reshape processes, to establish and use principles in order to determine appropriate ways of approaching activities, and to establish criteria for judging quality of process and outcome.

Key competencies are essential features of each of the units of competency and therefore consideration must be given to the ways in which they can be addressed when designing learning activities and assessment instruments.

Advice regarding the key competencies at Certificate I, II and III in the Metal and Engineering Training Package is contained in the Assessment Guidelines of the Training Package. This information is reproduced in the Support Document for this Syllabus.

13.3 Articulation to further training

Students achieving units of competency in this Framework can apply to have those units recognised in other endorsed Training Package qualifications.

Students and teachers should investigate the qualifications within the Metal and Engineering Training Package (MEM05) to identify possible training pathways. In some instances these may include higher-level courses at TAFE NSW or other RTOs which may provide for advanced standing in related university courses.

Students seeking to gain credit towards AQF VET qualifications in other industries may use the qualifications gained in metal and engineering as evidence of competency for related units of competency in any national Training Package.

Further information on requirements and arrangements for post-school apprenticeships and traineeships in the metal, engineering and related industries is available from the NSW Department of Education and Training State Training Centres and New Apprenticeship Centres.

14 AQF VET Qualifications

The various titles of AQF VET qualifications reflect levels of performance and degrees of responsibility in a workplace context. The level of a qualification thus provides an indication of the standard of achievement expected, which is comparable across industries and provides a context for assessment.

Industry curriculum frameworks relate to Certificates I to III. Brief descriptions of Certificates I, II and III, adapted from the *Australian Qualifications Framework Implementation Handbook*,⁹ are provided below.

Certificate I

Work is likely to be carried out under direct supervision. Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities, most of which would be routine and predictable.

An individual demonstrating competencies at this level would be able to:

- demonstrate knowledge by recall in a narrow range of areas
- demonstrate basic practical skills, such as the use of relevant tools
- perform a sequence of routine tasks given clear direction
- receive and pass on messages/information.

Certificate II

Work is likely to be carried out under direct supervision. Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge applications where the range of choices of action is clearly defined and of limited complexity.

An individual demonstrating competencies at this level would be able to:

- demonstrate basic operational knowledge in a moderate range of areas
- apply a defined range of skills
- apply known solutions to a limited range of predictable problems
- perform a range of tasks where choice is required between options within a limited range
- assess and record information from various sources
- take limited responsibility for their own outputs in work and learning.

Certificate III

Breadth, depth and complexity of knowledge and competencies would cover the selecting, adapting and transferring of skills and knowledge to new environments, and providing technical advice and some leadership in the resolution of specific problems. This would be applied across a range of roles in a variety of contexts, with some complexity in the extent and choice of options available.

⁹ Australian Qualifications Framework (AQF) Advisory Board, 2003, *Australian Qualifications Framework Implementation Handbook*, third edition, Carlton, VIC.

An individual demonstrating these competencies would be able to:

- perform a defined range of skilled operations, usually within a range of broader, related activities involving known routines, methods and procedures
- exercise some discretion and judgement in the selection of equipment, services or contingency measures
- operate within known time constraints
- take some responsibility for others
- participate in teams, including group or team coordination.

AQF VET Statements of Attainment and Certificates are ONLY issued on the basis of successful achievement of a unit of competency as determined by a qualified assessor.

15 Minimum Requirements for AQF VET Qualifications

The following pages outline the qualification packaging rules for the AQF VET qualifications available in this Framework. This information is reproduced directly from the **Metal and Engineering Training Package (MEM05)**. It is included so that the minimum requirements for achieving the industry qualifications are clear. Students who meet these requirements will be eligible for the relevant AQF VET Certificate, whether or not they have met the additional requirements of the HSC course.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM10105: Certificate I in Engineering

The minimum requirements for achievement of the Certificate I in Engineering are:

- completion of all of the core units of competency listed below, and
- completion of elective units from the list below to the value of at least 24 points.

Points associated with prerequisites count towards the total.

Appropriate elective units to the value of 7 points may be chosen from other endorsed Training Packages and accredited courses where those units are available at Certificate I.

Registered Training Organisations must seek a determination from Manufacturing Skills Australia for the allocation of points values for units of competency drawn from other Training Packages or accredited courses.

Note that the Group A elective units listed below include all the MEM units that are approved for selection in this qualification. This meets the NQC requirement that one sixth of the total units must be able to be selected from other qualifications in the same Training Package.

Core units

- select all of the units from this list

Unit code	Unit title
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15024A	Apply quality procedures
MEM16007A	Work with others in a manufacturing, engineering or related environment

Group A – elective units

- select elective units from this list to the value of at least 24 points, including any prerequisites.

Unit code	Unit title	Points
MEM03001B	Perform manual production assembly	4
MEM03002B	Perform precision assembly	4
MEM03003B	Perform sheet and plate assembly	4
MEM03004B	Perform electronic/electrical assembly (production)	8
MEM03006B	Set assembly stations	2
MEM04004B	Prepare and mix sand for metal moulding	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM04008B	Fettle and trim metal castings/forgings	4
MEM04018B	Perform general woodworking machine operations	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05003B	Perform soft soldering	2
MEM05004C	Perform routine oxy acetylene welding	2
MEM05005B	Carry out mechanical cutting	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM05007C	Perform manual heating and thermal cutting	2
MEM05012C	Perform routine manual metal arc welding	2
MEM05013C	Perform manual production welding	2
MEM06001B	Perform hand forging	4
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07003B	Perform machine setting (routine)	4
MEM07024B	Operate and monitor machine/process	4
MEM07028B	Operate computer controlled machines/processes	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4
MEM07030C	Perform metal spinning lathe operations (basic)	8
MEM07032B	Use workshop machines for basic operations	2
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08004B	Finish work using wet, dry and vapour deposition methods	4
MEM08009C	Make up solutions	2
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4
MEM08014B	Apply protective coatings (basic)	4
MEM08016B	Control blast coating by-products, materials and emissions	1
MEM11005B	Pick and process order	4
MEM11006B	Perform production packaging	2
MEM11007B	Administer inventory procedures	4
MEM11008B	Package materials (stores and warehouse)	2
MEM11009B	Handle/move bulk fluids/gases	4
MEM11011B	Undertake manual handling	2
MEM11013B	Undertake warehouse retrieval process	4
MEM11016B	Order materials	2
MEM12001B	Use comparison and basic measuring devices	2
MEM12002B	Perform electrical/electronic measurement	2
MEM12023A	Perform engineering measurements	5

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM12024A	Perform computations	3
MEM13001B	Perform emergency first aid	1
MEM13002B	Undertake occupational health and safety activities in the workplace	3
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM14005A	Plan a complete activity	4
MEM15001B	Perform basic statistical quality control	2
MEM15002A	Apply quality systems	2
MEM15003B	Use improvement processes in team activities	4
MEM16004B	Perform internal/external customer service	2
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2
MEM16006A	Organise and communicate information	2
MEM16008A	Interact with computing technology	2
MEM17003A	Assist in the provision of on the job training	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18013B	Perform gland packing	2
MEM18038B	Maintain wheels and tyres	2
MEM19001B	Perform jewellery metal casting	6
MEM19002B	Prepare jewellery illustrations	4
MEM19003B	Handle gem materials	2
MEM19006B	Replace watch batteries	1
MEM19009B	Perform investment procedures for lost wax casting process	1
MEM19010B	Produce rubber moulds for lost wax casting process	2
MEM19011B	Perform wax injection of moulds for lost wax casting process	2
MEM19014B	Perform hand engraving	4
MEM19015B	Perform jewellery enamelling	4
MEM19016B	Construct jewellery components	4
MEM19017B	Fabricate jewellery items	6
MEM20001A	Produce keys	4
MEM20002A	Assemble and test lock mechanisms	6
MEM20003A	Install and upgrade locks and hardware	4
MEM25001B	Apply fibre-reinforced materials	2
MEM25002B	Form and integrate fibre-reinforced structures	4
MEM25004B	Fair and shape surfaces	2
MEM25006B	Undertake marine sheathing operations	2
MEM25007B	Maintain marine vessel surfaces	4
MEM25014B	Perform marine slipping operations	2
MEM50002B	Work safely on marine craft	1

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM50003B	Follow work procedures to maintain the marine environment	1
MEM50004B	Maintain quality of environment by following marina codes	1
MEM50009B	Safely operate a mechanically powered recreational boat	2
	Appropriate elective units to the value of 7 points may be chosen from other endorsed Training Packages and accredited courses, where those units are available at Certificate I.	

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM10205: Certificate I in Boating Services

The minimum requirements for achievement of the Certificate I in Boating Services are:

- completion of all of the Mandatory units of competency listed below, and
- completion of three elective units from the list below.

Note that when selecting elective units any prerequisites units must also be completed and count towards the required number of elective units.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of the units from the list

Unit code	Unit title
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15024A	Apply quality procedures
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM50001B	Classify recreational boating technologies and features
MEM50002B	Work safely on marine craft
MEM50003B	Follow work procedures to maintain the marine environment

and

Elective units

- select three units from this list.

Unit code	Unit title
MEM09002B	Interpret technical drawing
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling
MEM12023A	Perform engineering measurements
MEM13003B	Work safely with industrial chemicals and materials
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEM50004B	Maintain quality of environment by following marina codes
MEM50005B	Refuel vessels
MEM50006B	Check operational capability of marine craft
MEM50007B	Check operational capability of sails and sail operating equipment
MEM50008B	Carry out trip preparation and planning
MEM50009B	Safely operate a mechanically powered recreational boat
MEM50010B	Respond to boating emergencies and incidents

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM20105: Certificate II in Engineering

The minimum requirements for achievement of the Certificate II in Engineering are:

- completion of all of the core units of competency listed below, and
- completion of elective units from the list below to the value of at least 30 points.

Points associated with prerequisites count towards the total.

Appropriate elective units to the value of 8 points may be chosen from other endorsed Training Packages and accredited courses where those units are available at Certificate II.

Registered Training Organisations must seek a determination from Manufacturing Skills Australia for the allocation of points values for units of competency drawn from other Training Packages or accredited courses.

Note that the Group A elective units listed below include all the MEM units that are approved for selection in this qualification. This meets the NQC requirement that one sixth of the total units must be able to be selected from other qualifications in the same Training Package.

Additional qualification descriptors

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

Marine Craft Manufacturing; Surface Finishing.

Core units

- select all of the units from this list

Unit code	Unit title
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16007A	Work with others in a manufacturing, engineering or related environment

Group A – Elective units

- select elective units from this list to the value of at least 30 points, including any prerequisites.

Unit code	Unit title	Points
MEM03001B	Perform manual production assembly	4
MEM03002B	Perform precision assembly	4
MEM03003B	Perform sheet and plate assembly	4
MEM03004B	Perform electronic/electrical assembly (production)	8
MEM03005B	Rework and repair (electrical/electronic production)	8
MEM03006B	Set assembly stations	2
MEM04001B	Operate melting furnaces	4
MEM04002B	Perform gravity die casting	2
MEM04003B	Operate pressure die casting machine	4
MEM04004B	Prepare and mix sand for metal moulding	4
MEM04006B	Operate sand moulding and core making machines	8

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM04007B	Pour molten metal	4
MEM04008B	Fettle and trim metal castings/forgings	4
MEM04018B	Perform general woodworking machine operations	4
MEM04019B	Perform refractory installation and repair	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05002B	Perform high reliability soldering and desoldering	4
MEM05003B	Perform soft soldering	2
MEM05004C	Perform routine oxy acetylene welding	2
MEM05005B	Carry out mechanical cutting	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM05007C	Perform manual heating and thermal cutting	2
MEM05012C	Perform routine manual metal arc welding	2
MEM05013C	Perform manual production welding	2
MEM05041B	Weld using powder flame spraying	4
MEM05049B	Perform routine gas tungsten arc welding	2
MEM05050B	Perform routine gas metal arc welding	2
MEM06001B	Perform hand forging	4
MEM06002B	Perform hammer forging	4
MEM06003C	Carry out heat treatment	6
MEM06005B	Perform drop and upset forging	4
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07003B	Perform machine setting (routine)	4
MEM07015B	Set computer controlled machines/processes	2
MEM07024B	Operate and monitor machine/process	4
MEM07025B	Perform advanced machine/process operation	6
MEM07026B	Perform advanced plastic processing	6
MEM07027B	Perform advanced press operations	6
MEM07028B	Operate computer controlled machines/processes	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4
MEM07030C	Perform metal spinning lathe operations (basic)	8
MEM07031C	Perform metal spinning lathe operations (complex)	4
MEM07032B	Use workshop machines for basic operations	2
MEM07033B	Operate and monitor basic boiler	6
MEM07034A	Operate and monitor intermediate class boiler	4
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08003C	Perform electroplating operations	6
MEM08004B	Finish work using wet, dry and vapour deposition methods	4
MEM08005B	Prepare and produce specialised coatings	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	2
MEM08007B	Control surface finish production and finished product quality	4
MEM08008B	Operate and control surface finishing waste treatment process	3
MEM08009C	Make up solutions	2
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	4
MEM08014B	Apply protective coatings (basic)	4
MEM08015B	Apply protective coatings (advanced)	4
MEM08016B	Control blast coating by-products, materials and emissions	1
MEM09002B	Interpret technical drawing	4
MEM10002B	Terminate and connect electrical wiring	3
MEM10013A	Install split air conditioning systems and associated pipework	6
MEM11001C	Erect/dismantle scaffolding and equipment	4
MEM11002C	Erect/dismantle complex scaffolding and equipment	4
MEM11004B	Undertake dogging	4
MEM11005B	Pick and process order	4
MEM11006B	Perform production packaging	2
MEM11007B	Administer inventory procedures	4
MEM11008B	Package materials (stores and warehouse)	2
MEM11009B	Handle/move bulk fluids/gases	4
MEM11010B	Operate mobile load shifting equipment	4
MEM11011B	Undertake manual handling	2
MEM11012B	Purchase materials	6
MEM11013B	Undertake warehouse retrieval process	4
MEM11014B	Undertake warehouse dispatch process	4
MEM11016B	Order materials	2
MEM11017B	Organise and lead stocktakes	4
MEM11018B	Organise and maintain warehouse stock retrieval and/or dispatch system	6
MEM11019B	Undertake tool store procedures	4
MEM11020B	Perform advanced warehouse computer operations	4
MEM11021B	Perform advanced operation of load shifting equipment	2
MEM11022B	Operate fixed/moveable load shifting equipment	4
MEM12001B	Use comparison and basic measuring devices	2
MEM12002B	Perform electrical/electronic measurement	2
MEM12019B	Measure components using coordinate measuring machines	4
MEM12023A	Perform engineering measurements	5
MEM12024A	Perform computations	3
MEM13001B	Perform emergency first aid	1

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM13002B	Undertake occupational health and safety activities in the workplace	3
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM13007B	Maintain water treatment systems for cooling towers	2
MEM13013B	Work safely with ionizing radiation	4
MEM14005A	Plan a complete activity	4
MEM15001B	Perform basic statistical quality control	2
MEM15003B	Use improvement processes in team activities	4
MEM16002C	Conduct formal interviews and negotiations	4
MEM16004B	Perform internal/external customer service	2
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2
MEM16006A	Organise and communicate information	2
MEM16008A	Interact with computing technology	2
MEM17001B	Assist in development and deliver training in the workplace	2
MEM17002B	Conduct workplace assessment	2
MEM17003A	Assist in the provision of on the job training	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18013B	Perform gland packing	2
MEM18024B	Maintain engine cooling systems	2
MEM18025B	Service combustion engines	2
MEM18026C	Test compression ignition fuel systems	4
MEM18027C	Overhaul engine fuel system components	8
MEM18028B	Maintain engine lubrication systems	2
MEM18029B	Tune diesel engines	4
MEM18038B	Maintain wheels and tyres	2
MEM18055B	Dismantle, replace and assemble engineering components	3
MEM18071B	Connect/disconnect fluid conveying system components	2
MEM18072B	Manufacture fluid conveying conductor assemblies	4
MEM18084A	Commission and decommission split air conditioning systems	4
MEM18085A	Install, service and repair domestic air conditioning and refrigeration appliances	6
MEM18086B	Test, recover, evacuate and charge refrigeration systems	4
MEM19001B	Perform jewellery metal casting	6
MEM19002B	Prepare jewellery illustrations	4
MEM19003B	Handle gem materials	2
MEM19004B	Handle and examine gemstone materials	6
MEM19006B	Replace watch batteries	1
MEM19007B	Perform gemstone setting	6
MEM19009B	Perform investment procedures for lost wax casting process	1
MEM19010B	Produce rubber moulds for lost wax casting process	2

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM19011B	Perform wax injection of moulds for lost wax casting process	2
MEM19014B	Perform hand engraving	4
MEM19015B	Perform jewellery enamelling	4
MEM19016B	Construct jewellery components	4
MEM19017B	Fabricate jewellery items	6
MEM19020B	Fault-find and maintain micro-mechanisms	4
MEM19021B	Diagnose and service micro-mechanisms	6
MEM20001A	Produce keys	4
MEM20002A	Assemble and test lock mechanisms	6
MEM20003A	Install and upgrade locks and hardware	4
MEM20004A	Gain entry	4
MEM25001B	Apply fibre-reinforced materials	2
MEM25002B	Form and integrate fibre-reinforced structures	4
MEM25004B	Fair and shape surfaces	2
MEM25006B	Undertake marine sheathing operations	2
MEM25007B	Maintain marine vessel surfaces	4
MEM25011B	Install marine systems	8
MEM25012B	Install and test operations of marine auxiliary systems	6
MEM25014B	Perform marine slipping operations	2
MEM25015A	Assemble and install equipment and accessories/ancillaries	2
MEM50002B	Work safely on marine craft	1
MEM50003B	Follow work procedures to maintain the marine environment	1
MEM50004B	Maintain quality of environment by following marina codes	1
MEM50009B	Safely operate a mechanically powered recreational boat	2
PMBPROD291A	Operate resin infusion moulding equipment	2
PMBPROD294A	Operate resin transfer moulding equipment	2
PMBPROD298A	Operate equipment using pre-pregs material	2
Appropriate specialist elective units to the value of 8 points may be chosen from other endorsed Training Packages and accredited courses where those units are available at Certificate II.		

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM20205: Certificate II in Engineering – Production Technology

The minimum requirements for achievement of the Certificate II in Engineering – Production Technology are:

- completion of all of the core units of competency listed below, and
- completion of elective units from the list below to the value of at least 53 points.

Points associated with prerequisites count towards the total.

Appropriate elective units to the value of 14 points may be chosen from other endorsed Training Packages and accredited courses where those units are available at Certificate II.

Registered Training Organisations must seek a determination from Manufacturing Skills Australia for the allocation of points values for units of competency drawn from other Training Packages or accredited courses.

Note that the Group A elective units listed below include all the MEM units that are approved for selection in this qualification. This meets the NQC requirement that one sixth of the total units must be able to be selected from other qualifications in the same Training Package.

Additional qualification descriptors

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

Marine Craft Manufacturing; Surface Finishing; Marine Craft Surface Finishing

Core units

- select all of the units from this list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM17003A	Assist in the provision of on the job training

Group A – elective units

- select elective units from this list to the value of at least 53 points, including any prerequisites.

Unit code	Unit title	Points
MEM03001B	Perform manual production assembly	4
MEM03002B	Perform precision assembly	4
MEM03003B	Perform sheet and plate assembly	4
MEM03004B	Perform electronic/electrical assembly (production)	8
MEM03005B	Rework and repair (electrical/electronic production)	8
MEM03006B	Set assembly stations	2
MEM04001B	Operate melting furnaces	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM04002B	Perform gravity die casting	2
MEM04003B	Operate pressure die casting machine	4
MEM04004B	Prepare and mix sand for metal moulding	4
MEM04006B	Operate sand moulding and core making machines	8
MEM04007B	Pour molten metal	4
MEM04008B	Fettle and trim metal castings/forgings	4
MEM04018B	Perform general woodworking machine operations	4
MEM04019B	Perform refractory installation and repair	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05002B	Perform high reliability soldering and desoldering	4
MEM05003B	Perform soft soldering	2
MEM05004C	Perform routine oxy acetylene welding	2
MEM05005B	Carry out mechanical cutting	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM05007C	Perform manual heating and thermal cutting	2
MEM05009C	Perform automated thermal cutting	2
MEM05012C	Perform routine manual metal arc welding	2
MEM05013C	Perform manual production welding	2
MEM05014C	Monitor quality of production welding/fabrications	2
MEM05015D	Weld using manual metal arc welding process	4
MEM05017D	Weld using gas metal arc welding process	4
MEM05019D	Weld using gas tungsten arc welding process	4
MEM05023C	Weld using submerged arc welding process	4
MEM05041B	Weld using powder flame spraying	4
MEM05049B	Perform routine gas tungsten arc welding	2
MEM05050B	Perform routine gas metal arc welding	2
MEM05051A	Select welding processes	2
MEM05052A	Apply safe welding practices	4
MEM05053A	Set and edit computer controlled thermal cutting machines	4
MEM06001B	Perform hand forging	4
MEM06002B	Perform hammer forging	4
MEM06003C	Carry out heat treatment	6
MEM06004B	Select heat treatment processes and test finished product	6
MEM06005B	Perform drop and upset forging	4
MEM06006C	Repair springs	4
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2
MEM06008A	Hammer forge complex shapes	4
MEM06009A	Hand forge complex shapes	4
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07003B	Perform machine setting (routine)	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM07004B	Perform machine setting (complex)	8
MEM07005C	Perform general machining	8
MEM07014B	Perform electro-discharge (EDM) machining operations	4
MEM07015B	Set computer controlled machines/processes	2
MEM07016C	Set and edit computer controlled machines/processes	4
MEM07024B	Operate and monitor machine/process	4
MEM07025B	Perform advanced machine/process operation	6
MEM07026B	Perform advanced plastic processing	6
MEM07027B	Perform advanced press operations	6
MEM07028B	Operate computer controlled machines/processes	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4
MEM07030C	Perform metal spinning lathe operations (basic)	8
MEM07031C	Perform metal spinning lathe operations (complex)	4
MEM07032B	Use workshop machines for basic operations	2
MEM07033B	Operate and monitor basic boiler	6
MEM07034A	Operate and monitor intermediate class boiler	4
MEM07040A	Set multistage integrated processes	6
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08003C	Perform electroplating operations	6
MEM08004B	Finish work using wet, dry and vapour deposition methods	4
MEM08005B	Prepare and produce specialised coatings	4
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	2
MEM08007B	Control surface finish production and finished product quality	4
MEM08008B	Operate and control surface finishing waste treatment process	3
MEM08009C	Make up solutions	2
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	4
MEM08014B	Apply protective coatings (basic)	4
MEM08015B	Apply protective coatings (advanced)	4
MEM08016B	Control blast coating by-products, materials and emissions	1
MEM08018B	Electroplate engineering coatings	6
MEM08019B	Electroplate protective finishes	6
MEM08020B	Electroplate decorative finishes	6
MEM09002B	Interpret technical drawing	4
MEM10002B	Terminate and connect electrical wiring	3
MEM10009B	Install refrigeration and air conditioning plant and equipment	4
MEM10010B	Install pipework and pipework assemblies	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM10011B	Terminate and connect specialist cables	3
MEM10013A	Install split air conditioning systems and associated pipework	6
MEM11001C	Erect/dismantle scaffolding and equipment	4
MEM11002C	Erect/dismantle complex scaffolding and equipment	4
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	4
MEM11004B	Undertake dogging	4
MEM11005B	Pick and process order	4
MEM11006B	Perform production packaging	2
MEM11007B	Administer inventory procedures	4
MEM11008B	Package materials (stores and warehouse)	2
MEM11009B	Handle/move bulk fluids/gases	4
MEM11010B	Operate mobile load shifting equipment	4
MEM11011B	Undertake manual handling	2
MEM11012B	Purchase materials	6
MEM11013B	Undertake warehouse retrieval process	4
MEM11014B	Undertake warehouse dispatch process	4
MEM11015B	Manage warehouse inventory system	6
MEM11016B	Order materials	2
MEM11017B	Organise and lead stocktakes	4
MEM11018B	Organise and maintain warehouse stock retrieval and/or dispatch system	6
MEM11019B	Undertake tool store procedures	4
MEM11020B	Perform advanced warehouse computer operations	4
MEM11021B	Perform advanced operation of load shifting equipment	2
MEM11022B	Operate fixed/moveable load shifting equipment	4
MEM12001B	Use comparison and basic measuring devices	2
MEM12002B	Perform electrical/electronic measurement	2
MEM12019B	Measure components using coordinate measuring machines	4
MEM12020B	Set and operate coordinate measuring machine	2
MEM12024A	Perform computations	3
MEM13001B	Perform emergency first aid	1
MEM13002B	Undertake occupational health and safety activities in the workplace	3
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM13007B	Maintain water treatment systems for cooling towers	2
MEM13013B	Work safely with ionizing radiation	4
MEM14005A	Plan a complete activity	4
MEM15001B	Perform basic statistical quality control	2
MEM15003B	Use improvement processes in team activities	4
MEM15004B	Perform inspection	2
MEM16002C	Conduct formal interviews and negotiations	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM16004B	Perform internal/external customer service	2
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2
MEM16008A	Interact with computing technology	2
MEM16013A	Operate in a self-directed team	2
MEM17001B	Assist in development and deliver training in the workplace	2
MEM17002B	Conduct workplace assessment	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18003C	Use tools for precision work	4
MEM18013B	Perform gland packing	2
MEM18024B	Maintain engine cooling systems	2
MEM18025B	Service combustion engines	2
MEM18026C	Test compression ignition fuel systems	4
MEM18027C	Overhaul engine fuel system components	8
MEM18028B	Maintain engine lubrication systems	2
MEM18029B	Tune diesel engines	4
MEM18030B	Diagnose and rectify low voltage electrical systems	8
MEM18031B	Diagnose and rectify low voltage starting systems	2
MEM18032B	Maintain induction/exhaust systems	4
MEM18033B	Perform engine bottom-end overhaul	4
MEM18035B	Diagnose and rectify braking systems	6
MEM18037B	Diagnose and rectify low voltage charging systems	2
MEM18038B	Maintain wheels and tyres	2
MEM18039B	Diagnose and rectify track type undercarriage	4
MEM18040B	Maintain suspension systems	4
MEM18041B	Maintain steering systems	4
MEM18042C	Diagnose and rectify manual transmissions	4
MEM18043C	Diagnose and rectify automatic transmissions	8
MEM18044C	Diagnose and rectify drive line and final drives	4
MEM18055B	Dismantle, replace and assemble engineering components	3
MEM18063B	Terminate signal and data cables	4
MEM18071B	Connect/disconnect fluid conveying system components	2
MEM18072B	Manufacture fluid conveying conductor assemblies	4
MEM18084A	Commission and decommission split air conditioning systems	4
MEM18085A	Install, service and repair domestic air conditioning and refrigeration appliances	6
MEM18086B	Test, recover, evacuate and charge refrigeration systems	4
MEM19001B	Perform jewellery metal casting	6
MEM19002B	Prepare jewellery illustrations	4
MEM19003B	Handle gem materials	2
MEM19004B	Handle and examine gemstone materials	6

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM19005B	Produce three-dimensional precision items	8
MEM19006B	Replace watch batteries	1
MEM19007B	Perform gemstone setting	6
MEM19008B	Prepare jewellery designs	6
MEM19009B	Perform investment procedures for lost wax casting process	1
MEM19010B	Produce rubber moulds for lost wax casting process	2
MEM19011B	Perform wax injection of moulds for lost wax casting process	2
MEM19012B	Produce jewellery wax model	4
MEM19013B	Produce jewellery metal masters	4
MEM19014B	Perform hand engraving	4
MEM19015B	Perform jewellery enamelling	4
MEM19016B	Construct jewellery components	4
MEM19017B	Fabricate jewellery items	6
MEM19018B	Repair jewellery items	6
MEM19020B	Fault-find and maintain micro-mechanisms	4
MEM19021B	Diagnose and service micro-mechanisms	6
MEM20001A	Produce keys	4
MEM20002A	Assemble and test lock mechanisms	6
MEM20003A	Install and upgrade locks and hardware	4
MEM20004A	Gain entry	4
MEM20006A	Maintain and service mechanical locking devices	6
MEM20014A	Perform a site security survey	2
MEM24001B	Perform basic penetrant testing	2
MEM24003B	Perform basic magnetic particle testing	2
MEM25001B	Apply fibre-reinforced materials	2
MEM25002B	Form and integrate fibre-reinforced structures	4
MEM25004B	Fair and shape surfaces	2
MEM25006B	Undertake marine sheathing operations	2
MEM25007B	Maintain marine vessel surfaces	4
MEM25011B	Install marine systems	8
MEM25012B	Install and test operations of marine auxiliary systems	6
MEM25014B	Perform marine slipping operations	2
MEM25015A	Assemble and install equipment and accessories/ancillaries	2
MEM50002B	Work safely on marine craft	1
MEM50003B	Follow work procedures to maintain the marine environment	1
MEM50004B	Maintain quality of environment by following marina codes	1
MEM50009B	Safely operate a mechanically powered recreational boat	2
PMBPROD291A	Operate resin infusion moulding equipment	2
PMBPROD294A	Operate resin transfer moulding equipment	2
PMBPROD298A	Operate equipment using pre-pregs material	2

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
PMBPROD391A	Produce composites using resin infusion	4
PMBPROD394A	Produce composites using resin transfer moulding	4
PMBPROD398A	Produce composites using pre-pregs	4
	Appropriate specialist elective units to the value of 14 points may be chosen from other endorsed Training Packages and accredited courses where those units are available at Certificate II.	

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM20305: Certificate II in Boating Services

The minimum requirements for achievement of the Certificate II in Boating Services are:

- completion of all of the Mandatory units of competency listed below, and
- completion of six elective units from the list below.

Note that when selecting elective units any prerequisites units must also be completed and can be counted towards the required number of elective units.

Note also that one elective unit of competency may alternatively be drawn from other endorsed Training Packages where that unit is available for inclusion at Certificate II. Only select a unit that would be suitable for occupational outcomes in a marine environment.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of the units from the list

Unit code	Unit title
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM50001B	Classify recreational boating technologies and features
MEM50002B	Work safely on marine craft
MEM50003B	Follow work procedures to maintain the marine environment

and

Elective units

- select six units from the list.

Unit code	Unit title
MEM04018B	Perform general woodworking machine operations
MEM05003B	Perform soft soldering
MEM05005B	Carry out mechanical cutting
MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM09002B	Interpret technical drawing
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM13003B	Work safely with industrial chemicals and materials
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEM25001B	Apply fibre-reinforced materials
MEM25004B	Fair and shape surfaces
MEM25007B	Maintain marine vessel surfaces
MEM50004B	Maintain quality of environment by following marina codes
MEM50005B	Refuel vessels
MEM50006B	Check operational capability of marine craft
MEM50007B	Check operational capability of sails and sail operating equipment
MEM50008B	Carry out trip preparation and planning
MEM50009B	Safely operate a mechanically powered recreational boat
MEM50010B	Respond to boating emergencies and incidents

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30205: Certificate III in Engineering – Mechanical Trade

This qualification covers the skills and knowledge required to work as an Engineering Tradesperson – Mechanical within metal, engineering, manufacturing and associated industries or other industries where Engineering Tradesperson – Mechanical work. The qualification has been specifically developed for apprentices in the above trade. The qualification packaging has been developed on an assumption that competency will be developed through a combination of on and off-the-job learning strategies such as those delivered through a formal apprenticeship. The qualification may also be achieved through formal skills recognition assessment processes.

Job roles/employment outcome

The Certificate III in Engineering – Mechanical Trade specifies the competencies required for employment as an Engineering Tradesperson – Mechanical including the design, assembly, manufacture, installation, modification, testing, fault finding, commissioning, maintenance and service of all mechanical equipment, machinery, fluid power systems, stationary and mobile equipment, instruments, refrigeration, and the use of computer controlled machine tools.

Employment outcomes related to this qualification are found in a wide variety of manufacturing and engineering related sectors as well as Engineering Tradesperson – Mechanical roles in other industries.

Application

This qualification is designed to provide an industry recognised skills profile related to trade work as an Engineering Tradesperson – Mechanical. Skills development would be undertaken through an Australian Apprenticeship arrangement where the mix of on and off-the-job training would be specified in the Training Plan associated with the Contract of Training between the employer and apprentice.

Assessment of some units of competency must, where indicated, include evidence of the candidate's performance in a productive work environment where there is a sufficient range of appropriate tasks and materials to cover the scope of application of those units. All outcomes must reflect the standard of performance inherent in the job.

Occupational titles that this qualification is suitable for may vary and include mechanical tradesperson, fitter and turner, fitter and machinist, maintenance fitter, diesel fitter, plant mechanic, refrigeration mechanic and 1st class machinist.

Pathways into the qualification

There is no qualification entry requirement. It is assumed that the learner is engaged as an apprentice under a Training Contract and that the learner is receiving appropriate structured on-the-job training while undertaking this qualification.

This qualification may be accessed by direct entry. Credit may be granted towards this qualification by those who have completed MEM10105 Certificate I in Engineering, MEM10205 Certificate I in Boating Services, MEM20105 Certificate II in Engineering, MEM20205 Certificate II in Engineering – Production Technology or other relevant qualifications. Credit towards this qualification may also include units of competency contained within relevant skill sets and Statements of Attainment.

Pathways from the qualification

Further training pathways from this qualification include MEM40105 Certificate IV in Engineering and MEM50105 Diploma of Engineering – Advanced Trade or other relevant qualifications.

Additional qualification advice

An additional descriptor may be added to this qualification to illustrate a particular skills focus or trade discipline.

This could be achieved by adding a pathway descriptor or sentence *below* the formal title of the qualification. Note that no changes may be made to the qualification title and the use of one of these descriptors to a qualification does not change the qualification's formal title or unique national code.

There are no specific requirements associated with the use of these descriptors other than their use should reflect the nature of the choice of units of competency in the qualification and must be consistent with the work role of an Engineering Tradesperson – Mechanical.

Reference to other occupational or functional pathways consistent with the role of an Engineering Tradesperson – Mechanical may be included on any qualification statement that is issued.

Competitive Manufacturing qualifications are available for employees at this level who already possess trade and other technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

There are no specific licences that relate to this qualification. However, some units in this qualification may relate to licensing or regulatory requirements. Where appropriate electives are taken it can also be used to satisfy regulations regarding refrigeration and airconditioning work. Local regulations should be checked for details.

The minimum requirements for achievement of the Certificate III in Engineering – Mechanical Trade are:

- completion of all of the Mandatory units of competency listed below, and
- completion of Mechanical Trade stream units from the list below to the value of at least 40 points, and
- completion of Specialisation units from the list on pages 77–86 to bring the total value of Mechanical Trade stream and Specialisation units to at least 76 points.

Points associated with prerequisites count towards the total. Note that up to 15 points value of units of competency may be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units that would be suitable for occupational outcomes in a mechanical trade environment.

Additional qualification descriptors

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

Refrigeration and Air-conditioning; Instrumentation; Maintenance; Patternmaking; Toolmaking; Watchmaking, Machining.

Mandatory units

- select all of the units from this list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM14005A	Plan a complete activity
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM16008A	Interact with computing technology
MEM17003A	Assist in the provision of on the job training

and

Mechanical Trade stream units

- select units from this list to the value of at least 40 points

Unit code	Unit title	Points
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07002B	Perform precision shaping/planing/slotting operations	4
MEM07003B	Perform machine setting (routine)	4
MEM07004B	Perform machine setting (complex)	8
MEM07005C	Perform general machining	8
MEM07006C	Perform lathe operations	4
MEM07007C	Perform milling operations	4
MEM07008D	Perform grinding operations	4
MEM07009B	Perform precision jig boring operations	4
MEM07010B	Perform tool and cutter grinding operations	4
MEM07011B	Perform complex milling operations	4
MEM07012B	Perform complex grinding operations	4
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines	4
MEM07014B	Perform electro-discharge (EDM) machining operations	4
MEM07015B	Set computer controlled machines/processes	2
MEM07016C	Set and edit computer controlled machines/processes	4
MEM07018C	Write basic NC/CNC programs	4
MEM07019C	Program NC/CNC machining centre	2
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre	2
MEM07021B	Perform complex lathe operations	4
MEM07022C	Program CNC wire cut machines	2
MEM07023C	Program and set up CNC manufacturing cell	6
MEM07024B	Operate and monitor machine/process	4
MEM07025B	Perform advanced machine/process operation	6
MEM07026B	Perform advanced plastic processing	6
MEM07027B	Perform advanced press operations	6
MEM07028B	Operate computer controlled machines/processes	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4
MEM07030C	Perform metal spinning lathe operations (basic)	8
MEM07031C	Perform metal spinning lathe operations (complex)	4
MEM07032B	Use workshop machines for basic operations	2
MEM07033B	Operate and monitor basic boiler	6
MEM07034A	Operate and monitor intermediate class boiler	4
MEM07040A	Set multistage integrated processes	6
MEM09002B	Interpret technical drawing	4
MEM09022A	Create 2D code files using computer aided manufacturing system	4
MEM10004B	Enter and change programmable controller operational parameters	2
MEM10006B	Install machine/plant	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM12003B	Perform precision mechanical measurement	2
MEM12006C	Mark off/out (general engineering)	4
MEM13007B	Maintain water treatment systems for cooling towers	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18003C	Use tools for precision work	4
MEM18004B	Maintain and overhaul mechanical equipment	4
MEM18005B	Perform fault diagnosis, installation and removal of bearings	4
MEM18006C	Repair and fit engineering components	6
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	4
MEM18008B	Balance equipment	2
MEM18009B	Perform levelling and alignment of machines and engineering components	4
MEM18010C	Perform equipment condition monitoring and recording	4
MEM18011C	Shut down and isolate machines/equipment	2
MEM18012B	Perform installation and removal of mechanical seals	2
MEM18013B	Perform gland packing	2
MEM18014B	Manufacture press tools and gauges	8
MEM18015B	Maintain tools and dies	4
MEM18018C	Maintain pneumatic system components	4
MEM18019B	Maintain pneumatic systems	4
MEM18020B	Maintain hydraulic system components	4
MEM18021B	Maintain hydraulic systems	4
MEM18022B	Maintain fluid power controls	8
MEM18024B	Maintain engine cooling systems	2
MEM18025B	Service combustion engines	2
MEM18026C	Test compression ignition fuel systems	4
MEM18027C	Overhaul engine fuel system components	8
MEM18028B	Maintain engine lubrication systems	2
MEM18029B	Tune diesel engines	4
MEM18030B	Diagnose and rectify low voltage electrical systems	8
MEM18031B	Diagnose and rectify low voltage starting systems	2
MEM18032B	Maintain induction/exhaust systems	4
MEM18033B	Perform engine bottom-end overhaul	4
MEM18034B	Perform engine top-end overhaul	8
MEM18035B	Diagnose and rectify braking systems	6
MEM18037B	Diagnose and rectify low voltage charging systems	2
MEM18038B	Maintain wheels and tyres	2
MEM18039B	Diagnose and rectify track type undercarriage	4
MEM18040B	Maintain suspension systems	4
MEM18041B	Maintain steering systems	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM18042C	Diagnose and rectify manual transmissions	4
MEM18043C	Diagnose and rectify automatic transmissions	8
MEM18044C	Diagnose and rectify drive line and final drives	4
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	4
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	10
MEM18047B	Diagnose and maintain electronic controlling systems on mobile plant	4
MEM18048B	Fault find and repair/rectify basic electrical circuits	12
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3
MEM18050C	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	3
MEM18051B	Fault find and repair/rectify complex electrical circuits	6
MEM18052B	Maintain fluid power systems for mobile plant	4
MEM18054B	Fault find, test and calibrate instrumentation systems and equipment	8
MEM18055B	Dismantle, replace and assemble engineering components	3
MEM18056B	Diagnose and repair analog equipment and components	10
MEM18057B	Maintain/service analog/digital electronic equipment	6
MEM18058C	Modify electronic equipment	4
MEM18060B	Maintain, repair control instrumentation – single and multiple loop control systems	8
MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	8
MEM18063B	Terminate signal and data cables	4
MEM18064B	Maintain instrumentation system components	6
MEM18065B	Diagnose and repair digital equipment and components	10
MEM18066B	Diagnose and repair microprocessor-based equipment	6
MEM18067B	Tune control loops – multi controller or multi element systems	6
MEM18071B	Connect/disconnect fluid conveying system components	2
MEM18072B	Manufacture fluid conveying conductor assemblies	4
MEM18086B	Test, recover, evacuate and charge refrigeration systems	4
MEM18087B	Service and repair domestic and light commercial refrigeration and air conditioning equipment	6
MEM18088B	Maintain and repair commercial air conditioning systems and components	4
MEM18089B	Maintain and repair central air handling systems	6
MEM18090B	Maintain and repair industrial refrigeration systems and components	6
MEM18091B	Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems	4
MEM18092B	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	6
MEM18094B	Service and repair commercial refrigeration	6
MEM18095A	Maintain and repair cooling towers/evaporative condensers and associated equipment	4
MEM18096A	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	6
MEM18097A	Manufacture cavity dies	8

and

Specialisation units

- select units from the list of Specialisation units on pages 77–86 to bring the total value of Mechanical Trade stream and Specialisation units to at least 76 points, including any prerequisites.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30305: Certificate III in Engineering – Fabrication Trade

This qualification covers the skills and knowledge required for employment as an Engineering Tradesperson – Fabrication within the metal, engineering, manufacturing and associated industries or other industries where Engineering Tradespersons – Fabrication work. The qualification has been specifically developed to meet the needs of apprentices in the above trade. The qualification packaging has been developed on an assumption that competency will be developed through an integrated combination of on and off-the-job learning strategies such as those delivered through a formal apprenticeship. The qualification may also be achieved through formal skills recognition assessment processes.

Job roles/employment outcomes

The Certificate III in Engineering – Fabrication Trade specifies the competencies required for employment as an Engineering Tradesperson – Fabrication including metal fabrication, forging, founding, structural steel erection, electroplating, metal spinning, metal polishing, sheet metal work, welding and the use of related computer controlled equipment.

Employment outcomes related to this qualification are found in a wide variety of manufacturing and engineering related sectors as well as Engineering Tradesperson – Fabrication roles in other industries.

Application

This qualification is designed to provide an industry recognised skills profile related to trade work as an Engineering Tradesperson – Fabrication. Skills development would usually be undertaken through an Australian Apprenticeship arrangement where the mix of on and off-the-job training would be specified in the Training Plan associated with the Contract of Training between the employer and apprentice.

Assessment of some units of competency must, where indicated, include evidence of the candidate's performance in a productive work environment where there is a sufficient range of appropriate tasks and materials to cover the scope of application of those units. All outcomes must reflect the standard of performance inherent in the job.

Occupational titles that this qualification is suitable for may vary and include metal fabrication tradesperson, boilermaker, 1st class sheet metal worker, 1st class welder, moulder, foundry tradesperson and patternmaker.

Pathways into the qualification

There is no qualification entry requirement. It is assumed that the learner is engaged as an apprentice under a Training Contract and that the learner is receiving appropriate structured on the job training while undertaking this qualification.

This qualification may be accessed by direct entry. Credit for relevant units of competency achieved should be granted towards this qualification for those who have completed MEM10105 Certificate I in Engineering, MEM10205 Certificate I in Boating Services, MEM20105 Certificate II in Engineering, MEM20205 Certificate II in Engineering – Production Technology or other relevant qualifications. Credit towards this qualification may also include units of competency contained within relevant pre-vocational and pre-apprenticeship programs and Statements of Attainment.

Pathways from the qualification

Further training pathways from this qualification include MEM40105 Certificate IV in Engineering and MEM50105 Diploma of Engineering – Advanced Trade or other relevant qualifications.

Additional qualification advice

An additional descriptor may be added to this qualification to illustrate a particular skill focus or trade discipline.

This could be achieved by adding a pathway descriptor or sentence *below* the formal title of the qualification. Note that no changes may be made to the qualification title and the use of one of these descriptors to a qualification does not change the qualification's formal title or unique national code.

There are no specific requirements associated with the use of these descriptors other than their use should reflect the nature of the choice of units of competency in the qualification and must be consistent with the work role of an Engineering Tradesperson – Fabrication.

Reference to other occupational or functional pathways consistent with the role of an Engineering Tradesperson – Fabrication may be included on any qualification statement that is issued.

Competitive Manufacturing qualifications are available for employees at this level who already possess trade and other technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

There are no specific licences that relate to this qualification. However, some units of competency in this qualification may relate to licensing or regulatory requirements. Local regulations should be checked for details.

The minimum requirements for achievement of the Certificate III in Engineering – Fabrication Trade are:

- completion of all of the Mandatory units of competency listed below, and
- completion of Fabrication Trade stream units from the list below to the value of at least 40 points, and
- completion of Specialisation units from the list on pages 77–86 to bring the total value of Fabrication Trade stream and Specialisation units to at least 76 points.

Points associated with prerequisites count towards the total. Note that up to 15 points value of units of competency may be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units that would be suitable for occupational outcomes in a fabrication trade environment.

Additional qualification descriptors

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

Casting and Moulding; Heavy Fabrication; Light Fabrication; Maintenance; Patternmaking; Surface Finishing; Welding

Mandatory units

- select all of the units from this list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM14005A	Plan a complete activity
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM16008A	Interact with computing technology
MEM17003A	Assist in the provision of on the job training

and

Fabrication Trade stream units

- select units from this list to the value of at least 40 points

Unit code	Unit title	Points
MEM03003B	Perform sheet and plate assembly	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM04001B	Operate melting furnaces	4
MEM04002B	Perform gravity die casting	2
MEM04003B	Operate pressure die casting machine	4
MEM04004B	Prepare and mix sand for metal moulding	4
MEM04005C	Produce moulds and cores by hand (jobbing)	16
MEM04006B	Operate sand moulding and core making machines	8
MEM04007B	Pour molten metal	4
MEM04008B	Fettle and trim metal castings/forgings	4
MEM04010B	Develop and manufacture wood patterns	20
MEM04011B	Produce polymer patterns	8
MEM04012B	Assemble plated patterns	8
MEM04013B	Develop and manufacture polystyrene patterns	2
MEM04014B	Develop and manufacture production patterns	8
MEM04015B	Develop and manufacture vacuum forming moulds and associated equipment	6
MEM04016C	Develop and manufacture precision models	6
MEM04017B	Develop and manufacture gear, conveyor screw and propeller patterns	4
MEM04018B	Perform general woodworking machine operations	4
MEM04019B	Perform refractory installation and repair	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05002B	Perform high reliability soldering and desoldering	4
MEM05003B	Perform soft soldering	2
MEM05004C	Perform routine oxy acetylene welding	2
MEM05005B	Carry out mechanical cutting	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM05007C	Perform manual heating and thermal cutting	2
MEM05008C	Perform advanced manual thermal cutting, gouging and shaping	2
MEM05009C	Perform automated thermal cutting	2
MEM05010C	Apply fabrication, forming and shaping techniques	8
MEM05011D	Assemble fabricated components	8
MEM05012C	Perform routine manual metal arc welding	2
MEM05013C	Perform manual production welding	2
MEM05014C	Monitor quality of production welding/fabrications	2
MEM05015D	Weld using manual metal arc welding process	4
MEM05016C	Perform advanced welding using manual metal arc welding process	4
MEM05017D	Weld using gas metal arc welding process	4
MEM05018C	Perform advanced welding using gas metal arc welding process	4
MEM05019D	Weld using gas tungsten arc welding process	4
MEM05020C	Perform advanced welding using gas tungsten arc welding process	4
MEM05022C	Perform advanced welding using oxy acetylene welding process	6
MEM05023C	Weld using submerged arc welding process	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM05026C	Apply welding principles	4
MEM05036C	Repair/replace/modify fabrications	4
MEM05037C	Perform geometric development	6
MEM05038B	Perform advanced geometric development – cylindrical/rectangular	2
MEM05039B	Perform advanced geometric development – conical	2
MEM05040B	Perform advanced geometric development – transitions	4
MEM05041B	Weld using powder flame spraying	4
MEM05047B	Weld using flux core arc welding process	4
MEM05048B	Perform advanced welding using flux core arc welding process	4
MEM05049B	Perform routine gas tungsten arc welding	2
MEM05050B	Perform routine gas metal arc welding	2
MEM05051A	Select welding processes	2
MEM05052A	Apply safe welding practices	4
MEM05053A	Set and edit computer controlled thermal cutting machines	4
MEM05054A	Write basic NC/CNC programs for thermal cutting machines	4
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08003C	Perform electroplating operations	6
MEM08004B	Finish work using wet, dry and vapour deposition methods	4
MEM08005B	Prepare and produce specialised coatings	4
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	2
MEM08007B	Control surface finish production and finished product quality	4
MEM08008B	Operate and control surface finishing waste treatment process	3
MEM08009C	Make up solutions	2
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	4
MEM08014B	Apply protective coatings (basic)	4
MEM08015B	Apply protective coatings (advanced)	4
MEM08016B	Control blast coating by-products, materials and emissions	1
MEM08018B	Electroplate engineering coatings	6
MEM08019B	Electroplate protective finishes	6
MEM08020B	Electroplate decorative finishes	6
MEM09002B	Interpret technical drawing	4
MEM10001C	Erect structures	4
MEM12007D	Mark off/out structural fabrications and shapes	4
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2

and

Specialisation units

- select units from the list of Specialisation units on pages 77–86 to bring the total value of Fabrication Trade stream and Specialisation units to at least 76 points, including any prerequisites.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30405: Certificate III in Engineering – Electrical/Electronic Trade

This qualification covers the skills and knowledge required for employment as an Engineering Tradesperson – Electrical/Electronic within the metal, engineering, manufacturing and associated industries or other industries where Engineering Tradespersons – Electrical/Electronic work. The qualification has been specifically developed for apprentices in the above trade. The qualification packaging has been developed on an assumption that competency will be developed through an integrated combination of on and off-the-job learning strategies such as those delivered through a formal apprenticeship. The qualification may also be achieved through formal skills recognition assessment processes.

Job roles/employment outcomes

The Certificate III in Engineering – Electrical/Electronic Trade specifies the competencies required for employment as an Engineering Tradesperson – Electrical/Electronic including the design, assembly, manufacture, installation, modification, testing, fault finding, commissioning, maintenance and service of all electrical and electronic devices systems, equipment and controls e.g. electrical wiring, motors, generators, PLCs, and other electronic controls, instruments, refrigeration, telecommunications, radio and television, communication and information processing.

Employment outcomes related to this qualification are found in a wide variety of manufacturing and engineering related sectors as well as Engineering Tradesperson – Electrical/Electronic trade related roles in other industries.

Application

This qualification is designed to provide an industry recognised skills profile related to trade work as an Engineering Tradesperson – Electrical/Electronic. Skills development would usually be undertaken through an Australian Apprenticeship arrangement where the mix of on and off-the-job training would be specified in the Training Plan associated with the Contract of Training between the employer and apprentice.

Assessment of some units of competency must, where indicated, include evidence of the candidate's performance in a productive work environment where there is a sufficient range of appropriate tasks and materials to cover the scope of application of those units. All outcomes must reflect the standard of performance inherent in the job.

Occupational titles at the enterprise level covered by this qualification may vary and include engineering tradesperson – electrical/electronic, electrical fitter, electrical mechanic, electrical fitter/mechanic, electrician, refrigeration mechanic and radio tradesperson.

Pathways into the qualification

While there is no qualification entry requirement, it is assumed that the learner is engaged as an apprentice under a Training Contract and that the learner is receiving appropriate structured on-the-job training while undertaking this qualification.

This qualification may be accessed by direct entry. Credit for relevant units of competency achieved should be granted towards this qualification for those who have completed MEM10105 Certificate I in Engineering, MEM10205 Certificate I in Boating Services, MEM20105 Certificate II in Engineering, MEM20205 Certificate II in Engineering – Production Technology or other relevant qualifications. Credit towards this qualification may also include units of competency contained within relevant pre-vocational and pre-apprenticeship programs and Statements of Attainment.

Pathways from the qualification

Further training pathways from this qualification include MEM40105 Certificate IV in Engineering, MSA41108 Certificate IV in Competitive Manufacturing, MSA40108 Certificate IV in Manufacturing Technology or other relevant qualifications.

Additional qualification advice

An additional descriptor may be added to this qualification title to illustrate a particular skills profile.

This could be achieved by adding a pathway descriptor or sentence *below* the formal title of the qualification. Note that no changes may be made to the qualification title and the use of one of these descriptors to a qualification does not change the qualification’s formal title or unique national code.

There are no specific requirements associated with the use of these descriptors other than their use should reflect the nature of the choice of units of competency in the qualification and must be consistent with the work role of an Engineering Tradesperson – Electrical/Electronic.

Reference to other occupational or functional pathways consistent with the role of an Engineering Tradesperson – Electrical/Electronic may be included on any qualification statement that is issued.

Competitive Manufacturing qualifications are available for employees at this level who already possess trade and other technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

If appropriate electives are undertaken this qualification can be used as the basis for an application in each state and territory for a license to practise as an electrician. It can also be used to satisfy regulations regarding refrigeration and airconditioning work. Local regulations should be checked for details.

The minimum requirements for achievement of the Certificate III in Engineering – Electrical/Electronic Trade are:

- completion of all of the Mandatory units of competency listed below, and
- completion of Electrical/Electronic Trade stream units from the list below to the value of at least 40 points, and
- completion of Specialisation units from the list on pages 77–86 to bring the total value of Electrical/Electronic Trade stream and Specialisation units to at least 76 points.

Points associated with prerequisites count towards the total. Note that up to 15 points value of units of competency may be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units that would be suitable for occupational outcomes in an electrical/electronic trade environment.

Additional qualification descriptors

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

Refrigeration and Air-conditioning; Instrumentation; Maintenance; Marine Electronics.

Mandatory units

- select all of the units from the list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM14005A	Plan a complete activity
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM16008A	Interact with computing technology
MEM17003A	Assist in the provision of on the job training

and

Electrical/Electronic Trade stream units

- select units from this list to the value of at least 40 points

Unit code	Unit title	Points
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05002B	Perform high reliability soldering and desoldering	4
MEM05003B	Perform soft soldering	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM09002B	Interpret technical drawing	4
MEM10002B	Terminate and connect electrical wiring	3
MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	12
MEM12002B	Perform electrical/electronic measurement	2
MEM12004B	Perform precision electrical/electronic measurement	4
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	4
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	10
MEM18047B	Diagnose and maintain electronic controlling systems on mobile plant	4
MEM18048B	Fault find and repair/rectify basic electrical circuits	12
MEM18949C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3
MEM18050C	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	3
MEM18051B	Fault find and repair/rectify complex electrical circuits	6
MEM18052B	Maintain fluid power systems for mobile plant	4
MEM18054B	Fault find, test and calibrate instrumentation systems and equipment	8
MEM18055B	Dismantle, replace and assemble engineering components	3
MEM18056B	Diagnose and repair analog equipment and components	10
MEM18057B	Maintain/service analog/digital electronic equipment	6
MEM18058C	Modify electronic equipment	4
MEM18060B	Maintain, repair control instrumentation – single and multiple loop control systems	8
MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	8
MEM18063B	Terminate signal and data cables	4
MEM18064B	Maintain instrumentation system components	6
MEM18065B	Diagnose and repair digital equipment and components	10

and

Specialisation units

- select units from this list of Specialisation units on pages 77–86 to bring the total value of Electrical/Electronic Trade stream and Specialisation units to at least 76 points, including any prerequisites.

Note: The following units of competency are required to meet the National Uniform Electrical Licensing ‘66 essential capabilities’ for an electrician’s license.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM12023A	Perform engineering measurements	n/a
MEM12024A	Perform computations	n/a
MEM13014A	Apply principles of occupational health and safety in the work environment	n/a
MEM14004A	Plan to undertake a routine task	n/a
MEM14005A	Plan a complete activity	n/a
MEM15002A	Apply quality systems	n/a
MEM15024A	Apply quality procedures	n/a
MEM16006A	Organise and communicate information	n/a
MEM16007A	Work with others in a manufacturing, engineering or related environment	n/a
MEM16008A	Interact with computing technology	n/a
MEM17003A	Assist in the provision of on the job training	n/a
MEM09002B	Interpret technical drawing	4
MEM10002B	Terminate and connect electrical wiring	3
MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	12
MEM10004B	Enter and change programmable controller operational parameters	2
MEM10011B	Terminate and connect specialist cables	3
MEM12002B	Perform electrical/electronic measurement	2
MEM12004B	Perform precision electrical/electronic measurement	4
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	10
MEM18048B	Fault find and repair/rectify basic electrical circuits	12
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3
MEM18051B	Fault find and repair/rectify complex electrical circuits	6
Points total		65

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30505: Certificate III in Engineering – Technical

The minimum requirements for achievement of the Certificate III in Engineering – Technical are:

- completion of the Mandatory units of competency listed below, and
- completion of eight elective units of competency from the list below.

Note that when selecting elective units any prerequisite units must also be completed and can be counted towards the required number of elective units.

Note also that additional requirements apply to the selection of non destructive testing units. These additional requirements are listed at the end of the list of elective units.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of the units from this list

Unit code	Unit title
MEM16006A	Organise and communicate information
MEM16008A	Interact with computing technology

Note: It is anticipated that many learners will have gained these skills through Year 12 school study and be eligible for recognition of prior learning. The actual awarding of the units will be subject to assessment by the Registered Training Provider offering the qualification.

and

Elective units

- select eight units from this list. Note that any prerequisites should be counted towards the eight required units.

Unit code	Unit title
MEM30001A	Use computer aided drafting systems to produce basic engineering drawings
MEM30002A	Produce basic engineering graphics
MEM30003A	Produce detailed engineering drawings
MEM30004A	Use CAD to create and display 3D models
MEM30005A	Calculate force systems within simple beam structures
MEM30006A	Calculate stresses in simple structures
MEM30007A	Select common engineering materials
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications
MEM30009A	Contribute to the design of basic mechanical systems
MEM30010A	Set up basic hydraulic circuits
MEM30011A	Set up basic pneumatic circuits
MEM30012A	Use mathematical techniques and perform simple statistical computations
MEM30013A	Assist in the preparation of a basic workplace layout
MEM30014A	Apply basic just in time systems to the reduction of waste

Unit code	Unit title
MEM30015A	Develop recommendations for basic set up time improvements
MEM30016A	Assist in the analysis of a supply chain
MEM30017A	Use basic preventative maintenance techniques and tools
MEM30018A	Undertake basic process planning
MEM30019A	Use resource planning software systems in manufacturing
MEM30020A	Develop and manage a plan for a simple manufacturing related project
MEM30021A	Prepare a simple production schedule
MEM30022A	Undertake supervised procurement activities
MEM30023A	Prepare a simple cost estimate for a manufactured product
MEM30024A	Participate in quality assurance techniques
MEM30025A	Analyse a simple electrical system circuit
MEM30026A	Select and test components for simple electronic switching and timing circuits
MEM30027A	Prepare basic programs for programmable logic controllers
MEM30028A	Assist in sales of technical products/systems
MEM12024A	Perform computations
MEM15001B	Perform basic statistical quality control
MEM18001C	Use hand tools
MEM24001B	Perform basic penetrant testing
MEM24003B	Perform basic magnetic particle testing
MEM24005B	Perform basic eddy current testing
MEM24007B	Perform ultrasonic thickness testing
MEM24009B	Perform basic radiographic testing
MEM13013B	Work safely with ionizing radiation

Special requirements for the selection of Non Destructive Testing units

In order to ensure that the Certificate III in Engineering – Technical aligns to occupational outcomes in industry the following additional rules apply to the selection of the following units –

- only two of:
 - MEM24001B Perform basic penetrant testing
 - MEM24003B Perform basic magnetic particle testing
 - MEM24005B Perform basic eddy current testing
 can be selected within the qualification, and

- only one of:
 - MEM24007B Perform ultrasonic thickness testing
 - MEM24009B Perform basic radiographic testing
 can be selected within the qualification.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30605: Certificate III in Jewellery Manufacture

The minimum requirements for achievement of the Certificate III in Jewellery Manufacture are:

- completion of all of the Mandatory units of competency listed below, and
- completion of Jewellery Manufacture stream units from the list below to the value of at least 40 points, and
- completion of Specialisation units from the list on pages 77–86 to bring the total value of Jewellery Manufacture stream and Specialisation units to at least 76 points.

Points associated with prerequisites count towards the total. Note that up to 15 points value of units of competency may be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units of competency would be suitable for occupational outcomes in a jewellery manufacturing environment.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of this units from the list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM14005A	Plan a complete activity
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM16008A	Interact with computing technology
MEM17003A	Assist in the provision of on the job training

and

Jewellery Manufacture stream units

- select units from this list to the value of at least 40 points

Unit code	Unit title	Points
MEM03001B	Perform manual production assembly	4
MEM03002B	Perform precision assembly	4
MEM03006B	Set assembly stations	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2
MEM07001B	Perform operational maintenance of machines/equipment	2

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM07005C	Perform general machining	8
MEM07024B	Operate and monitor machine/process	4
MEM07032B	Use workshop machines for basic operations	2
MEM07040A	Set multistage integrated processes	6
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08003C	Perform electroplating operations	6
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM09002B	Interpret technical drawing	4
MEM13002B	Undertake occupational health and safety activities in the workplace	3
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM15004B	Perform inspection	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18003C	Use tools for precision work	4
MEM19001B	Perform jewellery metal casting	6
MEM19002B	Prepare jewellery illustrations	4
MEM19003B	Handle gem materials	2
MEM19004B	Handle and examine gemstone materials	6
MEM19005B	Produce three-dimensional precision items	8
MEM19006B	Replace watch batteries	1
MEM19007B	Perform gemstone setting	6
MEM19008B	Prepare jewellery designs	6
MEM19009B	Perform investment procedures for lost wax casting process	1
MEM19010B	Produce rubber moulds for lost wax casting process	2
MEM19011B	Perform wax injection of moulds for lost wax casting process	2
MEM19012B	Produce jewellery wax model	4
MEM19013B	Produce jewellery metal masters	4
MEM19014B	Perform hand engraving	4
MEM19015B	Perform jewellery enamelling	4
MEM19016B	Construct jewellery components	4
MEM19017B	Fabricate jewellery items	6
MEM19018B	Repair jewellery items	6
MEM19020B	Fault-find and maintain micro-mechanisms	4
MEM19021B	Diagnose and service micro-mechanisms	6
MEM19022B	Perform precision micro-mechanism diagnosis and servicing	6

and

Specialisation units

- select units from the list of Specialisation units on pages 77–86 to bring the total value of Jewellery Manufacture stream and Specialisation units to at least 76 points, including any prerequisites.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

MEM30705: Certificate III in Marine Craft Construction

The minimum requirements for achievement of the Certificate III in Marine Craft Construction are:

- completion of all of the Mandatory units of competency listed below, and
- completion of Marine Craft Construction stream units from the list below to the value of at least 40 points, and
- completion of Specialisation units from the list on pages 77–86 to bring the total value of Marine Craft Construction stream and Specialisation units to at least 76 points.

Points associated with prerequisites count towards the total. Note that up to 15 points value of units of competency may be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units that would be suitable for occupational outcomes in a marine construction environment.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of the units from this list

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM14005A	Plan a complete activity
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM16008A	Interact with computing technology
MEM17003A	Assist in the provision of on the job training

and

Marine Craft Construction stream units

- select units from this list to the value of at least 40 points, and

Unit code	Unit title	Points
MEM04018B	Perform general woodworking machine operations	4
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07024B	Operate and monitor machine/process	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2

Unit code	Unit title	Points
MEM08014B	Apply protective coatings (basic)	4
MEM09002B	Interpret technical drawing	4
MEM09021B	Interpret and produce curved 3-dimensional shapes	4
MEM12007D	Mark off/out structural fabrications and shapes	4
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM25001B	Apply fibre-reinforced materials	2
MEM25002B	Form and integrate fibre-reinforced structures	4
MEM25003B	Set up marine vessel structures	4
MEM25004B	Fair and shape surfaces	2
MEM25005B	Construct and assemble marine vessel timber components	8
MEM25006B	Undertake marine sheathing operations	2
MEM25007B	Maintain marine vessel surfaces	4
MEM25008B	Repair marine vessel surfaces and structures	4
MEM25009B	Form timber shapes using hot processes	2
MEM25010B	Perform fitout procedures	4
MEM25011B	Install marine systems	8
MEM25012B	Install and test operations of marine auxiliary systems	6
MEM25013B	Produce three-dimensional plugs/moulds	12
MEM25014B	Perform marine slipping operations	2
MEM25015A	Assemble and install equipment and accessories/ancillaries	2
MEM50002B	Work safely on marine craft	1
MEM50003B	Follow work procedures to maintain the marine environment	1
MEM50004B	Maintain quality of environment by following marina codes	1
MEM50009B	Safely operate a mechanically powered recreational boat	2

and

Specialisation units

- select units from the list of Specialisation units on pages 77–86 to bring the value of Marine Craft Construction stream and Specialisation units to at least 76 points, including any prerequisites.

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements are outlined in Section 8.

Certificate III Trade Specialisation units

Units from the Specialisation units list below may be selected to bring the total value of Stream and Specialisation units to at least 76 points, including any prerequisites for the following certificates:

MEM30205	Certificate III in Engineering – Mechanical Trade
MEM30305	Certificate III in Engineering – Fabrication Trade
MEM30405	Certificate III in Engineering – Electrical/Electronic Trade
MEM30605	Certificate III in Jewellery Manufacture
MEM30705	Certificate III in Marine Craft Construction
MEM30805	Certificate III in Locksmithing

Specialisation units

Unit code	Unit title	Points
MEM03001B	Perform manual production assembly	4
MEM03002B	Perform precision assembly	4
MEM03003B	Perform sheet and plate assembly	4
MEM03004B	Perform electronic/electrical assembly (production)	8
MEM03005B	Rework and repair (electrical/electronic production)	8
MEM03006B	Set assembly stations	2
MEM04001B	Operate melting furnaces	4
MEM04002B	Perform gravity die casting	2
MEM04003B	Operate pressure die casting machine	4
MEM04004B	Prepare and mix sand for metal moulding	4
MEM04005C	Produce moulds and cores by hand (jobbing)	16
MEM04006B	Operate sand moulding and core making machines	8
MEM04007B	Pour molten metal	4
MEM04008B	Fettle and trim metal castings/forgings	4
MEM04010B	Develop and manufacture wood patterns	20
MEM04011B	Produce polymer patterns	8
MEM04012B	Assemble plated patterns	8
MEM04013B	Develop and manufacture polystyrene patterns	2
MEM04014B	Develop and manufacture production patterns	8
MEM04015B	Develop and manufacture vacuum forming moulds and associated equipment	6
MEM04016C	Develop and manufacture precision models	6
MEM04017B	Develop and manufacture gear, conveyor screw and propeller patterns	4
MEM04018B	Perform general woodworking machine operations	4
MEM04019B	Perform refractory installation and repair	4
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	4
MEM05002B	Perform high reliability soldering and desoldering	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM05003B	Perform soft soldering	2
MEM05004C	Perform routine oxy acetylene welding	2
MEM05005B	Carry out mechanical cutting	2
MEM05006B	Perform brazing and/or silver soldering	2
MEM05007C	Perform manual heating and thermal cutting	2
MEM05008C	Perform advanced manual thermal cutting, gouging and shaping	2
MEM05009C	Perform automated thermal cutting	2
MEM05010C	Apply fabrication, forming and shaping techniques	8
MEM05011D	Assemble fabricated components	8
MEM05012C	Perform routine manual metal arc welding	2
MEM05013C	Perform manual production welding	2
MEM05014C	Monitor quality of production welding/fabrications	2
MEM05015D	Weld using manual metal arc welding process	4
MEM05016C	Perform advanced welding using manual metal arc welding process	4
MEM05017D	Weld using gas metal arc welding process	4
MEM05018C	Perform advanced welding using gas metal arc welding process	4
MEM05019D	Weld using gas tungsten arc welding process	4
MEM05020C	Perform advanced welding using gas tungsten arc welding process	4
MEM05022C	Perform advanced welding using oxy acetylene welding process	6
MEM05023C	Weld using submerged arc welding process	4
MEM05036C	Repair/replace/modify fabrications	4
MEM05037C	Perform geometric development	6
MEM05038B	Perform advanced geometric development – cylindrical/rectangular	2
MEM05039B	Perform advanced geometric development – conical	2
MEM05040B	Perform advanced geometric development – transitions	4
MEM05041B	Weld using powder flame spraying	4
MEM05047B	Weld using flux core arc welding process	4
MEM05048B	Perform advanced welding using flux core arc welding process	4
MEM05049B	Perform routine gas tungsten arc welding	2
MEM05050B	Perform routine gas metal arc welding	2
MEM05051A	Select welding processes	2
MEM05052A	Apply safe welding practices	4
MEM05053A	Set and edit computer controlled thermal cutting machines	4
MEM05054A	Write basic NC/CNC programs for thermal cutting machines	4
MEM06001B	Perform hand forging	4
MEM06002B	Perform hammer forging	4
MEM06003C	Carry out heat treatment	6
MEM06004B	Select heat treatment processes and test finished product	6
MEM06005B	Perform drop and upset forging	4
MEM06006C	Repair springs	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2
MEM06008A	Hammer forge complex shapes	4
MEM06009A	Hand forge complex shapes	4
MEM07001B	Perform operational maintenance of machines/equipment	2
MEM07002B	Perform precision shaping/planing/slotting operations	4
MEM07003B	Perform machine setting (routine)	4
MEM07004B	Perform machine setting (complex)	8
MEM07005C	Perform general machining	8
MEM07006C	Perform lathe operations	4
MEM07007C	Perform milling operations	4
MEM07008D	Perform grinding operations	4
MEM07009B	Perform precision jig boring operations	4
MEM07010B	Perform tool and cutter grinding operations	4
MEM07011B	Perform complex milling operations	4
MEM07012B	Perform complex grinding operations	4
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines	4
MEM07014B	Perform electro-discharge (EDM) machining operations	4
MEM07015B	Set computer controlled machines/processes	2
MEM07016C	Set and edit computer controlled machines/processes	4
MEM07018C	Write basic NC/CNC programs	4
MEM07019C	Program NC/CNC machining centre	2
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre	2
MEM07021B	Perform complex lathe operations	4
MEM07022C	Program CNC wire cut machines	2
MEM07024B	Operate and monitor machine/process	4
MEM07025B	Perform advanced machine/process operation	6
MEM07026B	Perform advanced plastic processing	6
MEM07027B	Perform advanced press operations	6
MEM07028B	Operate computer controlled machines/processes	2
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4
MEM07030C	Perform metal spinning lathe operations (basic)	8
MEM07031C	Perform metal spinning lathe operations (complex)	4
MEM07032B	Use workshop machines for basic operations	2
MEM07033B	Operate and monitor basic boiler	6
MEM07034A	Operate and monitor intermediate class boiler	4
MEM07040A	Set multistage integrated processes	6
MEM08001B	Perform wire, jig and barrel load/unload work	4
MEM08002C	Pre-treat work for subsequent surface coating	4
MEM08003C	Perform electroplating operations	6
MEM08004B	Finish work using wet, dry and vapour deposition methods	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM08005B	Prepare and produce specialised coatings	4
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	2
MEM08007B	Control surface finish production and finished product quality	4
MEM08008B	Operate and control surface finishing waste treatment process	3
MEM08009C	Make up solutions	2
MEM08010B	Manually finish/polish materials	6
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	4
MEM08014B	Apply protective coatings (basic)	4
MEM08015B	Apply protective coatings (advanced)	4
MEM08016B	Control blast coating by-products, materials and emissions	1
MEM08018B	Electroplate engineering coatings	6
MEM08019B	Electroplate protective finishes	6
MEM08020B	Electroplate decorative finishes	6
MEM09002B	Interpret technical drawing	4
MEM09003B	Prepare basic engineering drawing	8
MEM09005B	Perform basic engineering detail drafting	8
MEM09011B	Apply basic engineering design concepts	6
MEM09021B	Interpret and produce curved 3-dimensional shapes	4
MEM09022A	Create 2D code files using computer aided manufacturing system	4
MEM10001C	Erect structures	4
MEM10002B	Terminate and connect electrical wiring	3
MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c. and 1500 volts d.c.	12
MEM10004B	Enter and change programmable controller operational parameters	2
MEM10005B	Commission programmable controller programs	4
MEM10006B	Install machine/plant	4
MEM10009B	Install refrigeration and air conditioning plant and equipment	4
MEM10010B	Install pipework and pipework assemblies	4
MEM10011B	Terminate and connect specialist cables	3
MEM10013A	Install split air conditioning systems and associated pipework	6
MEM11001C	Erect/dismantle scaffolding and equipment	4
MEM11002C	Erect/dismantle complex scaffolding and equipment	4
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	4
MEM11004B	Undertake dogging	4
MEM11005B	Pick and process order	4
MEM11006B	Perform production packaging	2
MEM11007B	Administer inventory procedures	4
MEM11008B	Package materials (stores and warehouse)	2
MEM11009B	Handle/move bulk fluids/gases	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM11010B	Operate mobile load shifting equipment	4
MEM11011B	Undertake manual handling	2
MEM11012B	Purchase materials	6
MEM11013B	Undertake warehouse receipt process	4
MEM11014B	Undertake warehouse dispatch process	4
MEM11015B	Manage warehouse inventory system	6
MEM11016B	Order materials	2
MEM11017B	Organise and lead stocktakes	4
MEM11018B	Organise and maintain warehouse stock receipt and/or dispatch system	6
MEM11019B	Undertake tool store procedures	4
MEM11020B	Perform advanced warehouse computer operations	4
MEM11021B	Perform advanced operation of load shifting equipment	2
MEM11022B	Operate fixed/moveable load shifting equipment	4
MEM12001B	Use comparison and basic measuring devices	2
MEM12002B	Perform electrical/electronic measurement	2
MEM12003B	Perform precision mechanical measurement	2
MEM12004B	Perform precision electrical/electronic measurement	4
MEM12006C	Mark off/out (general engineering)	4
MEM12007D	Mark off/out structural fabrications and shapes	4
MEM12019B	Measure components using coordinate measuring machines	4
MEM12020B	Set and operate coordinate measuring machine	2
MEM12021B	Program coordinate measuring machine	4
MEM12022B	Program coordinate measuring machines (advanced)	2
MEM12025A	Use graphical techniques and perform simple statistical computations	2
MEM13001B	Perform emergency first aid	1
MEM13002B	Undertake occupational health and safety activities in the workplace	3
MEM13003B	Work safely with industrial chemicals and materials	2
MEM13004B	Work safely with molten metals/glass	2
MEM13006B	Collect and evaluate occupational health and safety data for an enterprise or section of an enterprise	4
MEM13007B	Maintain water treatment systems for cooling towers	2
MEM13010A	Supervise occupational health and safety in an industrial work environment.	4
MEM13013B	Work safely with ionizing radiation	4
MEM15001B	Perform basic statistical quality control	2
MEM15003B	Use improvement processes in team activities	4
MEM15004B	Perform inspection	2
MEM15005B	Select and control inspection processes and procedures	4
MEM15015B	Examine trading practices	5
MEM15016B	Inspect pre-packed articles	8
MEM15022B	Verify reference standards	8

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM16001B	Give formal presentations and take part in meetings	2
MEM16002C	Conduct formal interviews and negotiations	4
MEM16004B	Perform internal/external customer service	2
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2
MEM16011A	Communicate with individuals and small groups	2
MEM16013A	Operate in a self-directed team	2
MEM17001B	Assist in development and deliver training in the workplace	2
MEM17002B	Conduct workplace assessment	2
MEM18001C	Use hand tools	2
MEM18002B	Use power tools/hand held operations	2
MEM18003C	Use tools for precision work	4
MEM18004B	Maintain and overhaul mechanical equipment	4
MEM18005B	Perform fault diagnosis, installation and removal of bearings	4
MEM18006C	Repair and fit engineering components	6
MEM18007B	Maintain and repair mechanical drives and mechanical transmission assemblies	4
MEM18008B	Balance equipment	2
MEM18009B	Perform levelling and alignment of machines and engineering components	4
MEM18010C	Perform equipment condition monitoring and recording	4
MEM18011C	Shut down and isolate machines/equipment	2
MEM18012B	Perform installation and removal of mechanical seals	2
MEM18013B	Perform gland packing	2
MEM18014B	Manufacture press tools and gauges	8
MEM18015B	Maintain tools and dies	4
MEM18018C	Maintain pneumatic system components	4
MEM18019B	Maintain pneumatic systems	4
MEM18020B	Maintain hydraulic system components	4
MEM18021B	Maintain hydraulic systems	4
MEM18022B	Maintain fluid power controls	8
MEM18024B	Maintain engine cooling systems	2
MEM18025B	Service combustion engines	2
MEM18026C	Test compression ignition fuel systems	4
MEM18027C	Overhaul engine fuel system components	8
MEM18028B	Maintain engine lubrication systems	2
MEM18029B	Tune diesel engines	4
MEM18030B	Diagnose and rectify low voltage electrical systems	8
MEM18031B	Diagnose and rectify low voltage starting systems	2
MEM18032B	Maintain induction/exhaust systems	4
MEM18033B	Perform engine bottom-end overhaul	4
MEM18034B	Perform engine top-end overhaul	8
MEM18035B	Diagnose and rectify braking systems	6

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM18037B	Diagnose and rectify low voltage charging systems	2
MEM18038B	Maintain wheels and tyres	2
MEM18039B	Diagnose and rectify track type undercarriage	4
MEM18040B	Maintain suspension systems	4
MEM18041B	Maintain steering systems	4
MEM18042C	Diagnose and rectify manual transmissions	4
MEM18043C	Diagnose and rectify automatic transmissions	8
MEM18044C	Diagnose and rectify drive line and final drives	4
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	4
MEM18046B	Fault find/repair electrical equipment/components up to 1000 volts a.c./1500 volts d.c.	10
MEM18047B	Diagnose and maintain electronic controlling systems on mobile plant	4
MEM18048B	Fault find and repair/rectify basic electrical circuits	12
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3
MEM18050C	Disconnect/reconnect fixed wired equipment over 1000 volts a.c./1500 volts d.c.	3
MEM18051B	Fault find and repair/rectify complex electrical circuits	6
MEM18052B	Maintain fluid power systems for mobile plant	4
MEM18054B	Fault find, test and calibrate instrumentation systems and equipment	8
MEM18055B	Dismantle, replace and assemble engineering components	3
MEM18056B	Diagnose and repair analog equipment and components	10
MEM18057B	Maintain/service analog/digital electronic equipment	6
MEM18058C	Modify electronic equipment	4
MEM18060B	Maintain, repair control instrumentation – single and multiple loop control systems	8
MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	8
MEM18063B	Terminate signal and data cables	4
MEM18064B	Maintain instrumentation system components	6
MEM18065B	Diagnose and repair digital equipment and components	10
MEM18066B	Diagnose and repair microprocessor-based equipment	6
MEM18067B	Tune control loops – multi controller or multi element systems	6
MEM18071B	Connect/disconnect fluid conveying system components	2
MEM18072B	Manufacture fluid conveying conductor assemblies	4
MEM18084A	Commission and decommission split air conditioning systems	4
MEM18085A	Install, service and repair domestic air conditioning and refrigeration appliances	6
MEM18086B	Test, recover, evacuate and charge refrigeration systems	4
MEM18087B	Service and repair domestic and light commercial refrigeration and air conditioning equipment	6
MEM18088B	Maintain and repair commercial air conditioning systems and components	4
MEM18089B	Maintain and repair central air handling systems	6
MEM18090B	Maintain and repair industrial refrigeration systems and components	6
MEM18091B	Maintain and repair multi stage, cascade and/or ultra-cold industrial refrigeration systems	4
MEM18092B	Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	6
MEM18094B	Service and repair commercial refrigeration	6

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM18095A	Maintain and repair cooling towers/evaporative condensers and associated equipment	4
MEM18096A	Maintain, repair/replace and adjust refrigerant flow controls and associated equipment	6
MEM18097A	Manufacture cavity dies	8
MEM19001B	Perform jewellery metal casting	6
MEM19002B	Prepare jewellery illustrations	4
MEM19003B	Handle gem materials	2
MEM19004B	Handle and examine gemstone materials	6
MEM19005B	Produce three-dimensional precision items	8
MEM19006B	Replace watch batteries	1
MEM19007B	Perform gemstone setting	6
MEM19008B	Prepare jewellery designs	6
MEM19009B	Perform investment procedures for lost wax casting process	1
MEM19010B	Produce rubber moulds for lost wax casting process	2
MEM19011B	Perform wax injection of moulds for lost wax casting process	2
MEM19012B	Produce jewellery wax model	4
MEM19013B	Produce jewellery metal masters	4
MEM19014B	Perform hand engraving	4
MEM19015B	Perform jewellery enamelling	4
MEM19016B	Construct jewellery components	4
MEM19017B	Fabricate jewellery items	6
MEM19018B	Repair jewellery items	6
MEM19020B	Fault-find and maintain micro-mechanisms	4
MEM19021B	Diagnose and service micro-mechanisms	6
MEM19022B	Perform precision micro-mechanism diagnosis and servicing	6
MEM20001A	Produce keys	4
MEM20002A	Assemble and test lock mechanisms	6
MEM20003A	Install and upgrade locks and hardware	4
MEM20004A	Gain entry	4
MEM20005A	Install and maintain door control devices/systems	2
MEM20006A	Maintain and service mechanical locking devices	6
MEM20007A	Plan and prepare a masterkey system	4
MEM20008A	Develop and implement a masterkey system	6
MEM20009A	Gain entry and reinstate fire and security containers	4
MEM20010A	Gain entry and reinstate automotive locking systems	4
MEM20011A	Service and repair fire and security containers	6
MEM20012A	Service and repair mechanical automotive locking systems	4
MEM20013A	Service automotive transponder systems	2
MEM20014A	Perform a site security survey	2
MEM24001B	Perform basic penetrant testing	2
MEM24002B	Perform penetrant testing	4

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
MEM24003B	Perform basic magnetic particle testing	2
MEM24004B	Perform magnetic particle testing	4
MEM24005B	Perform basic eddy current testing	2
MEM24006B	Perform eddy current testing	6
MEM24007B	Perform ultrasonic thickness testing	2
MEM24008B	Perform ultrasonic testing	6
MEM24009B	Perform basic radiographic testing	2
MEM24010B	Perform radiographic testing	6
MEM24012C	Apply metallurgy principles	4
MEM25001B	Apply fibre-reinforced materials	2
MEM25002B	Form and integrate fibre-reinforced structures	4
MEM25003B	Set up marine vessel structures	4
MEM25004B	Fair and shape surfaces	2
MEM25005B	Construct and assemble marine vessel timber components	8
MEM25006B	Undertake marine sheathing operations	2
MEM25007B	Maintain marine vessel surfaces	4
MEM25008B	Repair marine vessel surfaces and structures	4
MEM25009B	Form timber shapes using hot processes	2
MEM25010B	Perform fitout procedures	4
MEM25011B	Install marine systems	8
MEM25012B	Install and test operations of marine auxiliary systems	6
MEM25013B	Produce three-dimensional plugs/moulds	12
MEM25014B	Perform marine slipping operations	2
MEM25015A	Assemble and install equipment and accessories/ancillaries	2
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	4
MEM50002B	Work safely on marine craft	1
MEM50003B	Follow work procedures to maintain the marine environment	1
MEM50004B	Maintain quality of environment by following marina codes	1
MEM50009B	Safely operate a mechanically powered recreational boat	2
AURV225908A	Carry out panel repairs	4
ICTTC136B	Install, maintain and modify customer premises communications cabling: ACA Restricted Rule	6
ICTTC137B	Install, maintain and modify customer premises communications cabling: ACA Open Rule	6
PMBPROD291A	Operate resin infusion moulding equipment	2
PMBPROD294A	Operate resin transfer moulding equipment	2
PMBPROD298A	Operate equipment using pre-pregs material	2
PMBPROD391A	Produce composites using resin infusion	4
PMBPROD394A	Produce composites using resin transfer moulding	4
PMBPROD398A	Produce composites using pre-pregs	4
PRSTS202A	Install security equipment/system	4
PRSTS302A	Program security equipment/system	2

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title	Points
PRSTS303A	Test installed security equipment/system	2
PRSTS304A	Commission/decommission security equipment/system	2
PRSTS305A	Identify and diagnose electronic security equipment/ system fault	2
PRSTS307A	Maintain and service security equipment/system	4
PRSTS317A	Provide estimate and quote	4
PRSTS319A	Modify and repair security equipment/system	4

Please note: Only the shaded units of competency are available in the Metal and Engineering Curriculum Framework. HSC course requirements outlined in Section 8.

MEM30905: Certificate III in Boating Services

The minimum requirements for achievement of the Certificate III in Boating Services are:

- completion of all of the Mandatory units of competency listed below, and
- completion of fourteen elective units from the list below.

Note that when selecting elective units any prerequisites units must also be completed and can be counted towards the required number of elective units.

Note also that up to three elective units of competency may alternatively be drawn from other endorsed Training Packages where those units are available for inclusion at Certificate III. Only select units that would be suitable for occupational outcomes in a marine environment.

Additional qualification descriptors

There are no approved additional descriptors for this qualification.

Mandatory units

- select all of the units from this list

Unit code	Unit title
MEM13014A	Apply principles of occupational health and safety in the work environment
MEM14004A	Plan to undertake a routine task
MEM15024A	Apply quality procedures
MEM16006A	Organise and communicate information
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM50001B	Classify recreational boating technologies and features
MEM50002B	Work safely on marine craft
MEM50003B	Follow work procedures to maintain the marine environment

and

Elective units

- select fourteen units from this list.

Unit code	Unit title
MEM04018B	Perform general woodworking machine operations
MEM05003B	Perform soft soldering
MEM05005B	Carry out mechanical cutting
MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM09002B	Interpret technical drawing
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit code	Unit title
MEM12023A	Perform engineering measurements
MEM12006C	Mark off/out (general engineering)
MEM12007D	Mark off/out structural fabrications and shapes
MEM13003B	Work safely with industrial chemicals and materials
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEM25001B	Apply fibre-reinforced materials
MEM25004B	Fair and shape surfaces
MEM25007B	Maintain marine vessel surfaces
MEM50004B	Maintain quality of environment by following marina codes
MEM50005B	Refuel vessels
MEM50006B	Check operational capability of marine craft
MEM50007B	Check operational capability of sails and sail operating equipment
MEM50008B	Carry out trip preparation and planning
MEM50009B	Safely operate a mechanically powered recreational boat
MEM50010B	Respond to boating emergencies and incidents

Advice regarding the category status of units of competency from the HSC courses for each qualification available through the Metal and Engineering Curriculum Framework.

Table 5 Certificates I in Engineering and Boating Services; Certificates II in Engineering, Engineering – Production Technology and Boating Services

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
<i>Qualification packaging rules</i>					-4 core -24 points elective	-7 mandatory -3 electives	-5 core -30 points elective	-8 core -53 points elective	-8 mandatory -6 electives
N/A	Manufacturing, engineering and related services industries induction	10	compulsory (120 & 240)	–	–	–	–	–	–
MEM09002B	Interpret technical drawing	30	compulsory (240) elective (120)	4	–	elective	elective	elective	elective
MEM12023A	Perform engineering measurements	15	compulsory (240) elective (120)	5	elective	elective	elective	core	elective
MEM12024A	Perform computations	20	compulsory (240) elective (120)	3	elective	–	elective	elective	–
MEM13014A	Apply principles of occupational health and safety in the work environment	15	compulsory (120 & 240)	–	core	mandatory	core	core	mandatory
MEM14004A	Plan to undertake a routine task	10	compulsory (120 & 240)	–	core	mandatory	core	core	mandatory
MEM15002A	Apply quality systems	10	compulsory (240) elective (120)	2	elective	–	core	core	–
MEM15024A	Apply quality procedures	5	compulsory (120 & 240)	–	core	mandatory	core	core	mandatory
MEM16007A	Work with others in a manufacturing, engineering or related environment	15	compulsory (120 & 240)	–	core	mandatory	core	core	mandatory
MEM18001C	Use hand tools	20	compulsory (240) elective (120)	2	elective	elective	elective	elective	elective

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
MEM18002B	Use power tools/hand held operations	20	compulsory (240) elective (120)	2	elective	elective	elective	elective	elective
MEM03001B	Perform manual production assembly	35	elective (120, 240 & SS)	4	elective	–	elective	elective	–
MEM03003B [∇]	Perform sheet and plate assembly	35	elective (120, 240 & SS)	4	elective	–	elective	elective	–
MEM04018B [∇]	Perform general woodworking machine operations	15	elective (120, 240 & SS)	4	elective	–	elective	elective	elective
MEM05003B	Perform soft soldering	15	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM05004C	Perform routine oxy acetylene welding	15	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM05005B [∇]	Carry out mechanical cutting	5	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM05006B	Perform brazing and/or silver soldering	20	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM05007C	Perform manual heating and thermal cutting	10	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM05012C	Perform routine manual metal arc welding	20	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM05049B	Perform routine gas tungsten arc welding	20	elective (120, 240 & SS)	2	–	–	elective	elective	–
MEM05050B	Perform routine gas metal arc welding	20	elective (120, 240 & SS)	2	–	–	elective	elective	elective
MEM05051A	Select welding processes	10	elective (120, 240 & SS)	2	–	–	–	elective	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
MEM05052A	Apply safe welding practices	10	elective (120, 240 & SS)	4	–	–	–	elective	–
MEM07032B [∇]	Use workshop machines for basic operations	25	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM11011B	Undertake manual handling	5	elective (120, 240 & SS)	2	elective	elective	elective	elective	elective
MEM12001B	Use comparison and basic measuring devices	10	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM12006C [∇]	Mark off/out (general engineering)	25	elective (120, 240 & SS)	4	–	–	–	–	–
MEM13001B	Perform emergency first aid	10	elective (120, 240 & SS)	1	elective	–	elective	elective	–
MEM13003B	Work safely with industrial chemicals and materials	10	elective (120, 240 & SS)	2	elective	elective	elective	elective	elective
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	10	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM16006A	Organise and communicate information	15	elective (120, 240 & SS)	2	elective	–	elective	core	mandatory
MEM16008A	Interact with computing technology	10	elective (120, 240 & SS)	2	elective	–	elective	elective	–
MEM18003C [∇]	Use tools for precision work	15	elective (120, 240 & SS)	4	–	–	–	elective	–
MEM18055B [∇]	Dismantle, replace and assemble engineering components	30	elective (120, 240 & SS)	3	–	–	elective	elective	–
MEM19002B [∇]	Prepare jewellery illustrations	30	elective (120, 240 & SS)	4	elective	–	elective	elective	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
MEM19006B [∇]	Replace watch batteries	10	elective (120, 240 & SS)	1	elective	–	elective	elective	–
MEM19012B [∇]	Produce jewellery wax model	30	elective (120, 240 & SS)	4	–	–	–	elective	–
MEM19015B [∇]	Perform jewellery enamelling	35	elective (120, 240 & SS)	4	elective	–	elective	elective	–
MEM25001B [∇]	Apply fibre-reinforced materials	20	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM25004B [∇]	Fair and shape surfaces	30	elective (120, 240 & SS)	2	elective	–	elective	elective	elective
MEM25007B [∇]	Maintain marine vessel surfaces	30	elective (120, 240 & SS)	4	elective	–	elective	elective	elective
MEM50001B	Classify recreational boating technologies and features	20	elective (120, 240 & SS)	0	–	mandatory	–	–	mandatory
MEM50002B	Work safely on marine craft	15	elective (120, 240 & SS)	1	elective	mandatory	elective	elective	mandatory
MEM50003B	Follow work procedures to maintain the marine environment	10	elective (120, 240 & SS)	1	elective	mandatory	elective	elective	mandatory
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	20	elective (SS)	4	elective	–	elective	elective	–
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	20	elective (SS)	2	elective	–	elective	elective	–
MEM07003B [∇]	Perform machine setting (routine)	50	elective (SS)	4	elective	–	elective	elective	–
MEM07005C [∇]	Perform general machining	50	elective (SS)	8	–	–	–	elective	–
MEM07024B	Operate and monitor machine/process	30	elective (SS)	4	elective	–	elective	elective	–
MEM07028B [∇]	Operate computer controlled machine/processes	40	elective (SS)	2	elective	–	elective	elective	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
MEM08010B [∇]	Manually finish/polish materials	15	elective (SS)	6	elective	–	elective	elective	–
MEM09003B [∇]	Prepare basic engineering drawing	30	elective (SS)	8	–	–	–	–	–
MEM12007D [∇]	Mark off/out structural fabrications and shapes	30	elective (SS)	4	–	–	–	–	–
MEM13004B	Work safely with molten metals/glass	25	elective (SS)	2	elective	–	elective	elective	–
MEM15001B	Perform basic statistical quality control	30	elective (SS)	2	elective	–	elective	elective	–
MEM15003B [∇]	Use improvement processes in team activities	15	elective (SS)	4	elective	–	elective	elective	–
MEM19001B [∇]	Perform jewellery metal casting	30	elective (SS)	6	elective	–	elective	elective	–
MEM19014B [∇]	Perform hand engraving	20	elective (SS)	4	elective	–	elective	elective	–
MEM19016B [∇]	Construct jewellery components	30	elective (SS)	4	elective	–	elective	elective	–
MEM19017B [∇]	Fabricate jewellery items	50	elective (SS)	6	elective	–	elective	elective	–
MEM25002B [∇]	Form and integrate fibre-reinforced structures	30	elective (SS)	4	elective	–	elective	elective	–
MEM25006B [∇]	Undertake marine sheathing operations	15	elective (SS)	2	elective	–	elective	elective	–
MEM30001A [∇]	Use computer aided drafting systems to produce basic engineering drawings	50	elective (SS)	Nil	–	–	–	–	–
MEM30002A [∇]	Produce basic engineering graphics	30	elective (SS)	Nil	–	–	–	–	–
MEM50004B [∇]	Maintain quality of environment by following marina codes	10	elective (SS)	1	elective	elective	elective	elective	elective
MEM50005B [∇]	Refuel vessels	10	elective (SS)	0	–	elective	–	–	elective
MEM50006B [∇]	Check operational capability of marine craft	15	elective (SS)	0	–	elective	–	–	elective
MEM50007B [∇]	Check operational capability of sails and sail operating equipment	15	elective (SS)	0	–	elective	–	–	elective
MEM50008B	Carry out trip preparation and planning	15	elective (SS)	0	–	elective	–	–	elective

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate I in Engineering	Certificate I in Boating Services	Certificate II in Engineering	Certificate II in Engineering – Production Technology	Certificate II in Boating Services
MEM50009B	Safely operate a mechanically powered recreational boat	20	elective (SS)	2	elective	elective	elective	elective	elective
MEM50010B	Respond to boating emergencies and incidents	15	elective (SS)	0	–	elective	–	–	elective

Table 6 Certificates III in Engineering – Mechanical Trade, Fabrication Trade, Electrical/Electronic Trade; Jewellery Manufacture and Technical

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
<i>Qualification packaging rules</i>					-11 mandatory units -40 points of trade stream units -36 points of trade stream and/or specialisation units				-2 mandatory -8 electives
N/A	Manufacturing, engineering and related services industries induction	10	compulsory (120 & 240)	–	–	–	–	–	–
MEM09002B	Interpret technical drawing	30	compulsory (240) elective (120)	4	trade stream	trade stream	trade stream	trade stream	–
MEM12023A	Perform engineering measurements	15	compulsory (240) elective (120)	5	mandatory	mandatory	mandatory	mandatory	–
MEM12024A	Perform computations	20	compulsory (240) elective (120)	3	mandatory	mandatory	mandatory	mandatory	elective
MEM13014A	Apply principles of occupational health and safety in the work environment	15	compulsory (120 & 240)	–	mandatory	mandatory	mandatory	mandatory	–
MEM14004A	Plan to undertake a routine task	10	compulsory (120 & 240)	–	mandatory	mandatory	mandatory	mandatory	–
MEM15002A	Apply quality systems	10	compulsory (240) elective (120)	2	mandatory	mandatory	mandatory	mandatory	–
MEM15024A	Apply quality procedures	5	compulsory (120 & 240)	–	mandatory	mandatory	mandatory	mandatory	–
MEM16007A	Work with others in a manufacturing, engineering or related environment	15	compulsory (120 & 240)	–	mandatory	mandatory	mandatory	mandatory	–
MEM18001C	Use hand tools	20	compulsory (240) elective (120)	2	trade stream	trade stream	trade stream	trade stream	elective

^v This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
MEM18002B	Use power tools/hand held operations	20	compulsory (240) elective (120)	2	trade stream	trade stream	trade stream	trade stream	–
MEM03001B	Perform manual production assembly	35	elective (120, 240 & SS)	4	specialisation	specialisation	specialisation	trade stream	–
MEM03003B [∇]	Perform sheet and plate assembly	35	elective (120, 240 & SS)	4	specialisation	trade stream	specialisation	specialisation	–
MEM04018B [∇]	Perform general woodworking machine operations	15	elective (120, 240 & SS)	4	specialisation	trade stream	specialisation	specialisation	–
MEM05003B	Perform soft soldering	15	elective (120, 240 & SS)	2	specialisation	trade stream	trade stream	specialisation	–
MEM05004C	Perform routine oxy acetylene welding	15	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05005B [∇]	Carry out mechanical cutting	5	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05006B	Perform brazing and/or silver soldering	20	elective (120, 240 & SS)	2	specialisation	trade stream	trade stream	trade stream	–
MEM05007C	Perform manual heating and thermal cutting	10	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05012C	Perform routine manual metal arc welding	20	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05049B	Perform routine gas tungsten arc welding	20	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05050B	Perform routine gas metal arc welding	20	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–
MEM05051A	Select welding processes	10	elective (120, 240 & SS)	2	specialisation	trade stream	specialisation	specialisation	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
MEM05052A	Apply safe welding practices	10	elective (120, 240 & SS)	4	specialisation	trade stream	specialisation	specialisation	–
MEM07032B [∇]	Use workshop machines for basic operations	25	elective (120, 240 & SS)	2	trade stream	specialisation	specialisation	trade stream	–
MEM11011B	Undertake manual handling	5	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM12001B	Use comparison and basic measuring devices	10	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM12006C [∇]	Mark off/out (general engineering)	25	elective (120, 240 & SS)	4	trade stream	specialisation	specialisation	specialisation	–
MEM13001B	Perform emergency first aid	10	elective (120, 240 & SS)	1	specialisation	specialisation	specialisation	specialisation	–
MEM13003B	Work safely with industrial chemicals and materials	10	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	trade stream	–
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	10	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM16006A	Organise and communicate information	15	elective (120, 240 & SS)	2	mandatory	mandatory	mandatory	mandatory	mandatory
MEM16008A	Interact with computing technology	10	elective (120, 240 & SS)	2	mandatory	mandatory	mandatory	mandatory	mandatory
MEM18003C [∇]	Use tools for precision work	15	elective (120, 240 & SS)	4	trade stream	specialisation	specialisation	trade stream	–
MEM18055B [∇]	Dismantle, replace and assemble engineering components	30	elective (120, 240 & SS)	3	trade stream	specialisation	trade stream	specialisation	–
MEM19002B [∇]	Prepare jewellery illustrations	30	elective (120, 240 & SS)	4	specialisation	specialisation	specialisation	trade stream	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
MEM19006B [∇]	Replace watch batteries	10	elective (120, 240 & SS)	1	specialisation	specialisation	specialisation	trade stream	–
MEM19012B [∇]	Produce jewellery wax model	30	elective (120, 240 & SS)	4	specialisation	specialisation	specialisation	trade stream	–
MEM19015B [∇]	Perform jewellery enamelling	35	elective (120, 240 & SS)	4	specialisation	specialisation	specialisation	trade stream	–
MEM25001B [∇]	Apply fibre-reinforced materials	20	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM25004B [∇]	Fair and shape surfaces	30	elective (120, 240 & SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM25007B [∇]	Maintain marine vessel surfaces	30	elective (120, 240 & SS)	4	specialisation	specialisation	specialisation	specialisation	–
MEM50001B	Classify recreational boating technologies and features	20	elective (120, 240 & SS)	0	–	–	–	–	–
MEM50002B	Work safely on marine craft	15	elective (120, 240 & SS)	1	specialisation	specialisation	specialisation	specialisation	–
MEM50003B	Follow work procedures to maintain the marine environment	10	elective (120, 240 & SS)	1	specialisation	specialisation	specialisation	specialisation	–
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	20	elective (SS)	4	specialisation	trade stream	trade stream	specialisation	–
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	20	elective (SS)	2	specialisation	specialisation	specialisation	trade stream	–
MEM07003B [∇]	Perform machine setting (routine)	50	elective (SS)	4	trade stream	specialisation	specialisation	specialisation	–
MEM07005C [∇]	Perform general machining	50	elective (SS)	8	trade stream	specialisation	specialisation	trade stream	–
MEM07024B	Operate and monitor machine/process	30	elective (SS)	4	trade stream	specialisation	specialisation	trade stream	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
MEM07028B [∇]	Operate computer controlled machine/processes	40	elective (SS)	2	trade stream	specialisation	specialisation	specialisation	–
MEM08010B [∇]	Manually finish/polish materials	15	elective (SS)	6	specialisation	trade stream	specialisation	trade stream	–
MEM09003B [∇]	Prepare basic engineering drawing	30	elective (SS)	8	specialisation	specialisation	specialisation	specialisation	–
MEM12007D [∇]	Mark off/out structural fabrications and shapes	30	elective (SS)	4	specialisation	trade stream	specialisation	specialisation	–
MEM13004B	Work safely with molten metals/glass	25	elective (SS)	2	specialisation	specialisation	specialisation	trade stream	–
MEM15001B	Perform basic statistical quality control	30	elective (SS)	2	specialisation	specialisation	specialisation	specialisation	elective
MEM15003B [∇]	Use improvement processes in team activities	15	elective (SS)	4	specialisation	specialisation	specialisation	specialisation	–
MEM19001B [∇]	Perform jewellery metal casting	30	elective (SS)	6	specialisation	specialisation	specialisation	trade stream	–
MEM19014B [∇]	Perform hand engraving	20	elective (SS)	4	specialisation	specialisation	specialisation	trade stream	–
MEM19016B [∇]	Construct jewellery components	30	elective (SS)	4	specialisation	specialisation	specialisation	trade stream	–
MEM19017B [∇]	Fabricate jewellery items	50	elective (SS)	6	specialisation	specialisation	specialisation	trade stream	–
MEM25002B [∇]	Form and integrate fibre-reinforced structures	30	elective (SS)	4	specialisation	specialisation	specialisation	specialisation	–
MEM25006B [∇]	Undertake marine sheathing operations	15	elective (SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM30001A [∇]	Use computer aided drafting systems to produce basic engineering drawings	50	elective (SS)	Nil	–	–	–	–	elective
MEM30002A [∇]	Produce basic engineering graphics	30	elective (SS)	Nil	–	–	–	–	elective
MEM50004B [∇]	Maintain quality of environment by following marina codes	10	elective (SS)	1	specialisation	specialisation	specialisation	specialisation	–
MEM50005B [∇]	Refuel vessels	10	elective (SS)	0	–	–	–	–	–
MEM50006B [∇]	Check operational capability of marine craft	15	elective (SS)	0	–	–	–	–	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Engineering – Mechanical Trade	Certificate III in Engineering – Fabrication Trade	Certificate III in Engineering – Electrical/Electronic Trade	Certificate III in Engineering – Jewellery Manufacture	Certificate III in Engineering – Technical
MEM50007B [∇]	Check operational capability of sails and sail operating equipment	15	elective (SS)	0	–	–	–	–	–
MEM50008B	Carry out trip preparation and planning	15	elective (SS)	0	–	–	–	–	–
MEM50009B	Safely operate a mechanically powered recreational boat	20	elective (SS)	2	specialisation	specialisation	specialisation	specialisation	–
MEM50010B	Respond to boating emergencies and incidents	15	elective (SS)	0	–	–	–	–	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Table 7 Certificates III in Marine Craft Construction and Boating Services

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
<i>Qualification packaging rules</i>					-11 mandatory -40 points of trade stream -36 points of trade stream and/or specialisation	-8 mandatory -14 electives
N/A	Manufacturing, engineering and related services industries induction	10	compulsory (120 & 240)	–	–	–
MEM09002B	Interpret technical drawing	30	compulsory (240) elective (120)	4	trade stream	elective
MEM12023A	Perform engineering measurements	15	compulsory (240) elective (120)	5	mandatory	elective
MEM12024A	Perform computations	20	compulsory (240) elective (120)	3	mandatory	–
MEM13014A	Apply principles of occupational health and safety in the work environment	15	compulsory (120 & 240)	–	mandatory	mandatory
MEM14004A	Plan to undertake a routine task	10	compulsory (120 & 240)	–	mandatory	mandatory
MEM15002A	Apply quality systems	10	compulsory (240) elective (120)	2	mandatory	–
MEM15024A	Apply quality procedures	5	compulsory (120 & 240)	–	mandatory	mandatory
MEM16007A	Work with others in a manufacturing, engineering or related environment	15	compulsory (120 & 240)	–	mandatory	mandatory
MEM18001C	Use hand tools	20	compulsory (240) elective (120)	2	trade stream	elective

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
MEM18002B	Use power tools/hand held operations	20	compulsory (240) elective (120)	2	trade stream	elective
MEM03001B	Perform manual production assembly	35	elective (120, 240 & SS)	4	specialisation	–
MEM03003B [∇]	Perform sheet and plate assembly	35	elective (120, 240 & SS)	4	specialisation	–
MEM04018B [∇]	Perform general woodworking machine operations	15	elective (120, 240 & SS)	4	specialisation	elective
MEM05003B	Perform soft soldering	15	elective (120, 240 & SS)	2	specialisation	elective
MEM05004C	Perform routine oxy acetylene welding	15	elective (120, 240 & SS)	2	specialisation	–
MEM05005B [∇]	Carry out mechanical cutting	5	elective (120, 240 & SS)	2	specialisation	elective
MEM05006B	Perform brazing and/or silver soldering	20	elective (120, 240 & SS)	2	specialisation	–
MEM05007C	Perform manual heating and thermal cutting	10	elective (120, 240 & SS)	2	specialisation	elective
MEM05012C	Perform routine manual metal arc welding	20	elective (120, 240 & SS)	2	specialisation	elective
MEM05049B	Perform routine gas tungsten arc welding	20	elective (120, 240 & SS)	2	specialisation	–
MEM05050B	Perform routine gas metal arc welding	20	elective (120, 240 & SS)	2	specialisation	elective
MEM05051A	Select welding processes	10	elective (120, 240 & SS)	2	specialisation	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
MEM05052A	Apply safe welding practices	10	elective (120, 240 & SS)	4	specialisation	–
MEM07032B [∇]	Use workshop machines for basic operations	25	elective (120, 240 & SS)	2	specialisation	–
MEM11011B	Undertake manual handling	5	elective (120, 240 & SS)	2	specialisation	elective
MEM12001B	Use comparison and basic measuring devices	10	elective (120, 240 & SS)	2	specialisation	–
MEM12006C [∇]	Mark off/out (general engineering)	25	elective (120, 240 & SS)	4	specialisation	elective
MEM13001B	Perform emergency first aid	10	elective (120, 240 & SS)	1	specialisation	–
MEM13003B	Work safely with industrial chemicals and materials	10	elective (120, 240 & SS)	2	trade stream	elective
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	10	elective (120, 240 & SS)	2	specialisation	–
MEM16006A	Organise and communicate information	15	elective (120, 240 & SS)	2	mandatory	mandatory
MEM16008A	Interact with computing technology	10	elective (120, 240 & SS)	2	mandatory	–
MEM18003C [∇]	Use tools for precision work	15	elective (120, 240 & SS)	4	specialisation	–
MEM18055B [∇]	Dismantle, replace and assemble engineering components	30	elective (120, 240 & SS)	3	specialisation	–
MEM19002B [∇]	Prepare jewellery illustrations	30	elective (120, 240 & SS)	4	specialisation	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
MEM19006B [∇]	Replace watch batteries	10	elective (120, 240 & SS)	1	specialisation	–
MEM19012B [∇]	Produce jewellery wax model	30	elective (120, 240 & SS)	4	specialisation	–
MEM19015B [∇]	Perform jewellery enamelling	35	elective (120, 240 & SS)	4	specialisation	–
MEM25001B [∇]	Apply fibre-reinforced materials	20	elective (120, 240 & SS)	2	trade stream	elective
MEM25004B [∇]	Fair and shape surfaces	30	elective (120, 240 & SS)	2	trade stream	elective
MEM25007B [∇]	Maintain marine vessel surfaces	30	elective (120, 240 & SS)	4	trade stream	elective
MEM50001B	Classify recreational boating technologies and features	20	elective (120, 240 & SS)	0	–	mandatory
MEM50002B	Work safely on marine craft	15	elective (120, 240 & SS)	1	trade stream	mandatory
MEM50003B	Follow work procedures to maintain the marine environment	10	elective (120, 240 & SS)	1	trade stream	mandatory
MEM05001B	Perform manual soldering/desoldering – electrical/electronic components	20	elective (SS)	4	specialisation	–
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	20	elective (SS)	2	specialisation	–
MEM07003B [∇]	Perform machine setting (routine)	50	elective (SS)	4	specialisation	–
MEM07005C [∇]	Perform general machining	50	elective (SS)	8	specialisation	–
MEM07024B	Operate and monitor machine/process	30	elective (SS)	4	trade stream	–

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
MEM07028B [∇]	Operate computer controlled machine/processes	40	elective (SS)	2	specialisation	–
MEM08010B [∇]	Manually finish/polish materials	15	elective (SS)	6	specialisation	–
MEM09003B [∇]	Prepare basic engineering drawing	30	elective (SS)	8	specialisation	–
MEM12007D [∇]	Mark off/out structural fabrications and shapes	30	elective (SS)	4	trade stream	elective
MEM13004B	Work safely with molten metals/glass	25	elective (SS)	2	trade stream	–
MEM15001B	Perform basic statistical quality control	30	elective (SS)	2	specialisation	–
MEM15003B [∇]	Use improvement processes in team activities	15	elective (SS)	4	specialisation	–
MEM19001B [∇]	Perform jewellery metal casting	30	elective (SS)	6	specialisation	–
MEM19014B [∇]	Perform hand engraving	20	elective (SS)	4	specialisation	–
MEM19016B [∇]	Construct jewellery components	30	elective (SS)	4	specialisation	–
MEM19017B [∇]	Fabricate jewellery items	50	elective (SS)	6	specialisation	–
MEM25002B [∇]	Form and integrate fibre-reinforced structures	30	elective (SS)	4	trade stream	–
MEM25006B [∇]	Undertake marine sheathing operations	15	elective (SS)	2	trade stream	–
MEM30001A [∇]	Use computer aided drafting systems to produce basic engineering drawings	50	elective (SS)	Nil	–	–
MEM30002A [∇]	Produce basic engineering graphics	30	elective (SS)	Nil	–	–
MEM50004B [∇]	Maintain quality of environment by following marina codes	10	elective (SS)	1	trade stream	elective
MEM50005B [∇]	Refuel vessels	10	elective (SS)	0	–	elective
MEM50006B [∇]	Check operational capability of marine craft	15	elective (SS)	0	–	elective

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

Metal and Engineering Curriculum Framework Stage 6 Syllabus – Part A

Unit Code	Unit title	HSC hours	Metal and Engineering Curriculum Framework	Unit weight (points)	Certificate III in Marine Craft Construction	Certificate III in Boating Services
MEM50007B [∇]	Check operational capability of sails and sail operating equipment	15	elective (SS)	0	–	elective
MEM50008B	Carry out trip preparation and planning	15	elective (SS)	0	–	elective
MEM50009B	Safely operate a mechanically powered recreational boat	20	elective (SS)	2	trade stream	elective
MEM50010B	Respond to boating emergencies and incidents	15	elective (SS)	0	–	elective

[∇] This unit of competency has prerequisites. See pp 19–20 and 23–24 of this document.

16 Glossary

ANTA	Australian National Training Authority. Ceased operation 30 June 2005. The responsibilities and functions of ANTA have transferred to DEST.
AQF	Australian Qualifications Framework. The AQF is the policy framework that defines all qualifications recognised nationally in post-compulsory education and training in Australia. The AQF comprises titles and guidelines that define each qualification, together with principles and protocols covering cross-sectoral qualification linkages and the issuing of qualifications and statements of attainment.
AQTF	Australian Quality Training Framework. The AQTF is a comprehensive approach to national recognition of vocational education and training (VET). It is based on a quality-assured approach to the registration of providers who assess competency outcomes and issue qualifications. It includes mutual recognition, processes for registering training organisations, and quality assurance.
assessment guidelines	An endorsed component of a Training Package which underpins assessment and which sets out the industry approach to valid, reliable, flexible and fair assessment.
AVETMISS	Australian Vocational Education and Training Management Information Statistical Standard.
competency	The ability to perform tasks and duties to the standard expected in employment.
competency standard	An industry-determined specification of performance which sets out the skills, knowledge and attitudes required to operate effectively in employment. Competency standards are made up of units of competency (which are themselves made up of elements of competency) together with performance criteria, a range of variables, and an evidence guide. Competency standards are an endorsed component of a Training Package.
compulsory units of competency	Units that must be studied for the Higher School Certificate.
DEST	Department of Education, Science and Training.
elements of competency	The basic building blocks of a unit of competency which describe the key activities or elements of the work covered by the unit.
ICFIP	Industry Curriculum Framework Information Package. A document produced by the school system authorities to provide schools with information on teacher qualifications and resource requirements that must be adhered to for the delivery of vocational courses. It also includes quality assurance checklists that must be completed each year to demonstrate compliance with the Australian Quality Training Framework.

Industry Skills Councils (national)	<p>The Industry Skills Councils have two key roles:</p> <ul style="list-style-type: none"> • providing accurate industry intelligence to the VET sector about current and future skill needs and training requirements; and • supporting the development, implementation and continuous improvement of quality nationally recognised training products and services, including Training Packages.
ITAB (state)	<p>Industry Training Advisory Body. Independent incorporated associations or companies that assist with the development of training.</p>
mandatory units of competency	Units of competency required by the Training Package to be eligible for the AQF VET qualification.
national recognition	<p>National recognition is:</p> <ul style="list-style-type: none"> • the recognition and acceptance by an RTO of AQF qualifications and statements of attainments issued by other RTOs, enabling individuals to receive national recognition of qualifications and statements of attainment; and • the recognition for national operation of training organisations registered under the AQTF standards.
NTF	National Training Framework.
NTIS	<p>National Training Information Service. The national register for recording information about RTOs, Training Packages and accredited courses. (www.ntis.gov.au)</p>
OHS	Occupational Health and Safety.
QRRRC	<p>Qualifications, Recognition and Resource Requirements Committee. The QRRRC:</p> <ul style="list-style-type: none"> • determines the teacher qualifications and resource requirements for the delivery of VET courses in NSW schools • has responsibility for recognising teacher qualifications and recommending appropriate professional development for VET teachers • includes representatives from the school systems, industry, TAFE NSW and the Office of the Board of Studies.
qualification	<p>Formal certification in the VET sector by an RTO and means that a person has achieved all the units of competency or modules comprising learning outcomes stated for the qualification in:</p> <ul style="list-style-type: none"> • a nationally endorsed Training Package for which details of the qualification have been registered by ANTA; or • an accredited course that provides training for the qualification.
recognition of prior learning (RPL)	Recognition of competencies currently held, regardless of how, when or where the learning occurred. RPL assesses the individual's prior learning to determine the extent to which that individual is currently competent against the required learning outcomes, competency outcomes or standards for entry to, and/or partial or total completion of the qualification.

RTO	Registered Training Organisation. A training organisation registered by a registering body in accordance with the AQTF, within a defined scope of registration. (Includes TAFE NSW, private providers and schools.)
scope of registration	The defined scope for which a training organisation is registered that identifies the particular services and products that can be provided. An RTO may be registered to provide either: <ul style="list-style-type: none">• training delivery and assessment services and products and issue AQF qualifications and statements of attainment; or• assessment services and products and issue AQF qualifications and statements of attainment. The scope of registration is further defined by AQF qualifications and/or endorsed units of competency.
Statement of Attainment	Formal certification in the VET sector by an RTO under the AQF that a person has achieved: <ul style="list-style-type: none">• part of a qualification, or• one or more units of competency from a nationally endorsed Training Package, or• all the units of competency or modules comprising learning outcomes for an accredited course that does not meet the requirements for a qualification.
Training Packages	An integrated set of nationally endorsed competency standards, assessment guidelines and AQF qualifications for a specific industry, industry sector or enterprise.
training plan	A program of training and assessment which is required under an apprenticeship/traineeship training contract. The apprenticeship/traineeship training contract is registered with the appropriate state/territory government department or agency as may be required by state/territory legislation.
unit of competency	The specification of knowledge and skill and the application of that knowledge and skill to the standard of performance expected in the workplace.
VET	Vocational Education and Training.
VETAB	The Vocational Education and Training Accreditation Board.
VTO	Vocational Training Order

17 Metal and Engineering Curriculum Framework School-based Apprenticeship pathway

17.1 Metal and Engineering – School-based Apprenticeship (240 indicative hours)

Purpose

The purpose of this course is to provide school-based apprentices with the opportunity to gain credit towards Certificate III qualifications within manufacturing, engineering and related services industries and unit credit towards their HSC.

Course eligibility

It is available to students who meet the following requirements:

participation in an approved school-based apprenticeship training contract in one of the following:

- Certificate III in Engineering – Mechanical Trade
- Certificate III in Engineering – Fabrication Trade
- Certificate III in Engineering – Electrical/Electronic Trade.

Before offering the Metal and Engineering – School-based Apprenticeship course, schools should ensure that the RTO undertaking delivery has the scope to deliver the relevant qualification and/or relevant units of competency.

Course structure

Metal and Engineering – School-based Apprenticeship comprises 10 compulsory units of competency, the manufacturing, engineering and related services industries induction and an elective pool containing 93 units of competency listed in Table 8.

Details of the compulsory units of competency and the induction, including HSC requirements and advice, are included in Part B of the Syllabus.

Details of the elective units of competency listed in Table 8 are available in the Metal and Engineering Training Package (MEM05) at www.ntis.gov.au.

Metal and Engineering – School-based Apprenticeship (240 indicative hours) course is accredited for a total of four units at the Preliminary and/or HSC level.

Course requirements

- Students must attempt:
 - **ALL** compulsory units of competency
 - **AND** the manufacturing, engineering and related services industries induction
 - **PLUS** a selection of units of competency from the elective pool to a minimum value of 70 indicative hours.
- Mandatory work placement hour requirements for this course are met through the on-the-job training component of the school-based apprenticeship.

An external written Higher School Certificate examination will be conducted for this course. This examination is optional. In the year they will complete the course, students will specify whether or not they choose to undertake the external written examination (refer to Sections 11.2 and 11.3).

Table 8 Metal and Engineering – School-based Apprenticeship (240 indicative hours)

COMPULSORY Attempt ALL units				
Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
N/A	Manufacturing, engineering and related services industries induction	–	–	10
MEM09002B	Interpret technical drawing	4	Nil	30
MEM12023A	Perform engineering measurements	5	Nil	15
MEM12024A	Perform computations	3	Nil	20
MEM13014A	Apply principles of occupational health and safety in the work environment ⁸	–	Nil	15
MEM14004A	Plan to undertake a routine task	–	Nil	10
MEM15002A	Apply quality systems	2	Nil	10
MEM15024A	Apply quality procedures	–	Nil	5
MEM16007A	Work with others in a manufacturing, engineering or related environment	–	Nil	15
MEM18001C	Use hand tools	2	Nil	20
MEM18002B	Use power tools/hand held operations	2	Nil	20

⁸ Learning experiences for the HSC for this unit of competency must be undertaken prior to work placement.

Table 8 (cont/d)

ELECTIVE POOL				
Attempt units to a minimum value of 70 indicative hours				
Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
Assembly				
MEM03001B	Perform manual production assembly	4	Nil	35
MEM03002B	Perform precision assembly	4	MEM18001C	35
MEM03003B	Perform sheet and plate assembly	4	MEM18001C MEM18002B	35
MEM03004B	Perform electronic/electrical assembly (production)	8	Nil	50
MEM03006B	Set assembly stations	2	<i>Path 1</i> MEM03001B MEM18001C or <i>Path 2</i> MEM03003B MEM18001C MEM08002B or <i>Path 3</i> MEM03004B MEM18001C	20
Casting and moulding				
MEM04018B	Perform general woodworking machine operations	4	MEM12023A MEM18001C	15
Fabrication				
MEM05001B	Perform manual soldering/ desoldering – electrical/electronic components	4	Nil	20
MEM05003B	Perform soft soldering	2	Nil	15
MEM05004C	Perform routine oxy acetylene welding	2	Nil	15
MEM05005B	Carry out mechanical cutting	2	MEM12023A MEM18001C	5
MEM05006B	Perform brazing and/or silver soldering	2	Nil	20
MEM05007C	Perform manual heating and thermal cutting	2	Nil	10
MEM05010C	Apply fabrication, forming and shaping techniques	8	MEM05037C MEM09002B MEM12023A MEM12024A MEM18001C	25
MEM05012C	Perform routine manual metal arc welding	2	Nil	20
MEM05013C	Perform manual production welding	2	Nil	20

Table 8 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
MEM05015D	Weld using manual metal arc welding process	4	MEM05012C MEM05051A MEM05052A MEM12023A MEM18001C MEM18002B	25
MEM05017D	Weld using gas metal arc welding process	4	MEM05050B MEM05051A MEM05052A MEM12023A MEM18001C MEM18002B	25
MEM05019D	Weld using gas tungsten arc welding process	4	MEM05049B MEM05051A MEM05052A MEM12023A MEM18001C MEM18002B	25
MEM05037C	Perform geometric development	6	MEM09002B MEM12023A MEM12024A	35
MEM05047B	Weld using flux core arc welding process	4	MEM05050B MEM05051A MEM05052A MEM12023A MEM18001C MEM18002B	25
MEM05049B	Perform routine gas tungsten arc welding	2	Nil	20
MEM05050B	Perform routine gas metal arc welding	2	Nil	20
MEM05051A	Select welding processes	2	Nil	10
MEM05052A	Apply safe welding practices	4	Nil	10
Forging				
MEM06001B	Perform hand forging	4	MEM18001C	30
MEM06002B	Perform hammer forging	4	Nil	30
MEM06003C	Carry out heat treatment	6	Nil	40
MEM06004B	Select heat treatment processes and test finished product	6	MEM06003C	40
MEM06007B	Perform basic incidental heat/quenching, tempering and annealing	2	Nil	20
Machine and process operations				
MEM07001B	Perform operational maintenance of machines/equipment	2	MEM18001C	20
MEM07003B	Perform machine setting (routine)	4	MEM07024B MEM12023A MEM16006A MEM18001C	50

Table 8 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
MEM07005C	Perform general machining	8	MEM09002B MEM12023A MEM18001C	50
MEM07006C	Perform lathe operations	4	MEM07005C MEM09002B MEM12023A MEM18001C	25
MEM07007C	Perform milling operations	4	MEM07005C MEM09002B MEM12023A MEM18001C	25
MEM07008D	Perform grinding operations	4	MEM07005C MEM09002B MEM12023A MEM18001C	25
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines	4	MEM07005C MEM09002B MEM12023A MEM18001C	25
MEM07024B	Operate and monitor machine/process	4	Nil	30
MEM07028B	Operate computer controlled machines/processes	2	MEM07024B	40
MEM07029B	Perform routine sharpening/maintenance of production tools and cutters	4	MEM12023A MEM18001C	25
MEM07032B	Use workshop machines for basic operations	2	MEM18001C	25
Surface finishing				
MEM08001B	Perform wire, jig and barrel load/unload work	4	Nil	35
MEM08002C	Pre-treat work for subsequent surface coating	4	MEM13003B	35
MEM08004B	Finish work using wet, dry and vapour deposition methods	4	MEM08002C MEM13003B	25
MEM08005B	Prepare and produce specialised coatings	4	MEM08002C MEM13003B	25
MEM08006B	Produce clear and/or coloured and/or sealed anodised films on aluminium	2	MEM08002C	15
MEM08007B	Control surface finish production and finished product quality	4	Nil	35
MEM08008B	Operate and control surface finishing waste treatment process	3	MEM13003B	20
MEM08009C	Make up solutions	2	MEM13003B	15
MEM08010B	Manually finish/polish materials	6	MEM18001C	15
MEM08011B	Prepare surfaces using solvents and/or mechanical means	2	MEM13003B MEM18001C MEM18002B	15

Table 8 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
MEM08012B	Prepare surfaces by abrasive blasting (basic)	4	MEM08016B MEM13003B	30
MEM08014B	Apply protective coatings (basic)	4	MEM13003B	30
MEM08016B	Control blast coating by-products, materials and emissions	1	MEM13003B	5
Drawing, drafting and design				
MEM09003B	Prepare basic engineering drawing	8	MEM09002B	30
Installation and commissioning				
MEM10002B	Terminate and connect electrical wiring	3	MEM09002B MEM12002B MEM18001C	25
Materials handling				
MEM11001C	Erect/dismantle scaffolding and equipment	4	MEM18001C	20
MEM11004B	Undertake dogging	4	MEM18001C	20
MEM11005B	Pick and process order	4	Nil	20
MEM11006B	Perform production packaging	2	Nil	15
MEM11007B	Administer inventory procedures	4	Nil	10
MEM11008B	Package materials (stores and warehouse)	2	Nil	15
MEM11011B	Undertake manual handling	2	Nil	5
MEM11013B	Undertake warehouse receipt process	4	MEM11011B	20
MEM11014B	Undertake warehouse dispatch process	4	<i>Path 1</i> MEM11006B MEM11011B or <i>Path 2</i> MEM11008B MEM11011B	20
MEM11019B	Undertake tool store procedures	4	MEM11007B MEM11011B MEM11013B MEM12024A	20
Measurement				
MEM12001B	Use comparison and basic measuring devices	2	Nil	10
MEM12002B	Perform electrical/electronic measurement	2	Nil	20
MEM12003B	Perform precision mechanical measurement	2	MEM12023A	15
MEM12004B	Perform precision electrical/electronic measurement	4	Nil	25
MEM12006C	Mark off/out (general engineering)	4	MEM09002B MEM12023A	25
MEM12007D	Mark off/out structural fabrications and shapes	4	MEM12023A	30

Table 8 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
MEM12019B	Measure components using coordinate measuring machines	4	Nil	30
Occupational health and safety				
MEM13001B	Perform emergency first aid	1	Nil	10
MEM13003B	Work safely with industrial chemicals and materials	2	Nil	10
MEM13004B	Work safely with molten metals/glass	2	Nil	25
Planning				
MEM14005A	Plan a complete activity	4	Nil	20
Quality				
MEM15001B	Perform basic statistical quality control	2	Nil	30
MEM15003B	Use improvement processes in team activities	4	MEM16007A	15
MEM15004B	Perform inspection	2	Nil	15
Communication				
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	2	Nil	10
MEM16006A	Organise and communicate information	2	Nil	15
MEM16008A	Interact with computing technology	2	Nil	10
Maintenance and diagnostics				
MEM18003C	Use tools for precision work	4	MEM12023A MEM18001C MEM18002B	15
MEM18011C	Shut down and isolate machines/equipment	2	Nil	10
MEM18013B	Perform gland packing	2	MEM12023A MEM18001C	10
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	4	MEM09002B MEM10002B MEM12002B MEM12023A MEM18001C MEM18002B	35
MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.	3	MEM09002B MEM10002B MEM12002B MEM18001C	30
MEM18055B	Dismantle, replace and assemble engineering components	3	MEM09002B MEM12023A MEM18001C MEM18002B	30

Table 8 (cont/d)

Unit code	Unit title	Unit weight (points)	Prerequisites	HSC indicative hours of credit
MEM18063B	Terminate signal and data cables	4	MEM05001B MEM09002B MEM12002B MEM12023A MEM18001C	30
MEM18071B	Connect/disconnect fluid conveying system components	2	MEM13003B MEM18001C	20
PMBPROD291A	Operate resin infusion moulding equipment	2	Nil	20
PMBPROD294A	Operate resin transfer moulding equipment	2	Nil	20
PMBPROD298A	Operate equipment using pre-pregs material	2	Nil	20

Depending on the achievement of units of competency, the possible qualification outcome is:

- Statement of Attainment towards Certificate III in Engineering – Mechanical Trade (MEM30205)
- Statement of Attainment towards Certificate III in Engineering – Fabrication Trade (MEM30305)
- Statement of Attainment towards Certificate III in Engineering – Electrical/Electronic Trade (MEM30405).

AQF VET qualifications

To receive AQF VET qualifications, students must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

Qualification packaging rules are in Section 15 of this document.

Further information on assessment is in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.

17.2 Metal and Engineering – School-based Apprenticeship Specialisation (60 or 120 indicative hours)

Purpose

The purpose of this course is to provide school-based apprentices with the opportunity to gain further credit towards Certificate III qualifications within manufacturing, engineering and related services industries and unit credit towards their HSC.

Course eligibility

It is available to students who meet the following requirements:

participation in an approved school-based apprenticeship training contract in one of the following:

- Certificate III in Engineering – Mechanical Trade
- Certificate III in Engineering – Fabrication Trade
- Certificate III in Engineering – Electrical/Electronic Trade

and

are currently enrolled in, or have completed, the Metal and Engineering – School-based Apprenticeship (240 indicative hours).

The maximum number of Preliminary and/or HSC units available from the school-based apprenticeship pathway of this Framework is six units. That is, courses can total up to 360 hours. In addition to courses within the Framework students may undertake locally designed Board Endorsed VET courses drawing from the Metal and Engineering Training Package (MEM05). Such courses may provide additional HSC credit for students.

Before offering the Metal and Engineering – School-based Apprenticeship Specialisation course, schools should ensure that the RTO undertaking delivery has the scope to deliver the relevant qualification and/or relevant units of competency.

Course structure

The Metal and Engineering – School-based Apprenticeship Specialisation comprises units of competency drawn from the Metal and Engineering – School-based Apprenticeship (240 indicative hours) course (listed in Table 8) not previously attempted by students.

Details of the elective units of competency listed in Table 8 are available in the Metal and Engineering Training Package (MEM05) at www.ntis.gov.au.

The Metal and Engineering – School-based Apprenticeship Specialisation (60 indicative hours) course is accredited for one unit at the Preliminary or HSC level. The Metal and Engineering – School-based Apprenticeship Specialisation (120 indicative hours) course is accredited for a total of two units at the Preliminary and/or HSC level.

Course requirements

Students may only undertake a Metal and Engineering – School-based Apprenticeship Specialisation if they are currently enrolled in, or have completed, the Metal and Engineering – School-based Apprenticeship (240 indicative hours) course.

Metal and Engineering – School-based Apprenticeship Specialisation (60 indicative hours) course:

- Units of competency should be selected to a minimum of 60 indicative hours
- Mandatory work placement hour requirements for this course are met through the on-the-job training component of the school-based apprenticeship.

Metal and Engineering – School-based Apprenticeship Specialisation (120 indicative hours) course:

- Units of competency should be selected to a minimum of 120 indicative hours
- Mandatory work placement hour requirements for this course are met through the on-the-job training component of the school-based apprenticeship.

Depending on the achievement of units of competency, the possible qualification outcome is:

- Statement of Attainment towards Certificate III in Engineering – Mechanical Trade (MEM30205)
- Statement of Attainment towards Certificate III in Engineering – Fabrication Trade (MEM30305)
- Statement of Attainment towards Certificate III in Engineering – Electrical/Electronic Trade (MEM30405).

AQF VET qualifications

To receive AQF VET qualifications, students must meet the assessment requirements of the Metal and Engineering Training Package (MEM05). A qualified assessor must conduct the assessment.

Qualification packaging rules are in Section 15 of this document.

Further information on assessment is in Section 11 of this document and in the document *Assessment and Reporting in Metal and Engineering Stage 6*.