



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM30205 Certificate III in Engineering - Mechanical Trade**

**Release: 2**

## **MEM30205 Certificate III in Engineering - Mechanical Trade**

### **Modification History**

Not Applicable

## Description

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 Information

### *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 these can also be used to satisfy regulations regarding refrigeration and air conditioning work. Local regulations should be checked for details.

## **Licensing/Regulatory Information**

Refer to Pathways Information

## **Entry Requirements**

Not Applicable

## Employability Skills Summary

### EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	<ul style="list-style-type: none"> <li>• Read, interpret, follow and communicate information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents</li> <li>• Produce sketches, diagrams, charts or graphs</li> <li>• Check and clarify task-related information</li> <li>• Recognise and use common mechanical engineering terminology and symbols</li> <li>• Liaise with appropriate authorities</li> </ul>
Teamwork	<ul style="list-style-type: none"> <li>• Work alone or as part of a team</li> <li>• Contribute to a group effort in order to plan and carry out work</li> <li>• Identify work roles, communicate and cooperate with others</li> </ul>
Problem-solving	<ul style="list-style-type: none"> <li>• Undertake numerical operations, geometry and calculations/formulae (including addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages)</li> <li>• Use appropriate measuring techniques</li> <li>• Inspect quality of own or other employee's work</li> <li>• Analyse information according to enterprise and work requirements</li> <li>• Assess operation and condition of components against specifications or manufacturer's requirements</li> <li>• Use diagnostic skills and tests to identify and determine causes of faults, including interpretation of in-built fault indicators and error codes</li> <li>• Develop, implement and evaluate solutions to problems</li> <li>• Translate designs into practical outcomes</li> </ul>
Initiative and enterprise	<ul style="list-style-type: none"> <li>• Be capable of applying the competency in new and different situations and contexts</li> <li>• Identify actual and foreseeable workplace hazards during course of work</li> <li>• Implement OHS risk management procedures</li> <li>• Modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</li> <li>• Participate in improvement procedures including process, quality and internal/external customer/supplier relationships</li> <li>• Economise material and energy use and minimise waste</li> </ul>

**EMPLOYABILITY SKILLS QUALIFICATION SUMMARY**

Planning and organising	<ul style="list-style-type: none"> <li>• Plan, prioritise and sequence work operations/ complete activities/ scheduled production</li> <li>• Select and use planning techniques and tools</li> <li>• Organise and analyse information relevant to work</li> <li>• Set up jobs prior to commencement of work including selection of appropriate tools, equipment and materials and adjustment of equipment</li> </ul>
Self-management	<ul style="list-style-type: none"> <li>• Carry out work safely and in accordance with company policy and procedures, manufacturer's recommendations and legislative requirements</li> <li>• Monitor performance of operation or quality of product or service to ensure customer satisfaction</li> <li>• Take responsibility for own work outcomes</li> <li>• Apply techniques, procedures, tools and equipment for compliance with site or manufacturers' specifications.</li> </ul>
Learning	<ul style="list-style-type: none"> <li>• Check and clarify task related information with appropriate personnel or technical adviser</li> <li>• Identify customers' requirements with respect to the operation or quality of the product or service</li> <li>• Assess and modify own work practices</li> <li>• Use manuals, online help and other reference materials such as catalogues/lists as required</li> <li>• Maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments</li> <li>• Assist with on the job training and assessment</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• Select and use appropriate tools, equipment, materials and machines</li> <li>• Select and use appropriate measuring/testing devices</li> <li>• Navigate technology to access /input /store/retrieve/save and produce information/data using appropriate software applications</li> <li>• Apply knowledge of appropriate engineering principles, techniques, procedures, diagnostic methods, tools and equipment to achieve the required outcome</li> <li>• Calibrate equipment/instruments</li> <li>• Improve efficiency of machines and equipment in order to minimise waste</li> </ul>

**Packaging Rules**

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

- completion of all core units of competency listed below, and
- completion of Group A Mechanical Trade stream units to the value of at least 40 points, and
- completion of units from Group B Certificate III Trade specialisation units listed in Appendix 1, Volume 1 of the Training Package, to bring the total value to at least 73 points

Points associated with prerequisites count towards the total (refer to units and prerequisites listing in Appendix 2, Volume 1).

Appropriate Group B elective units to the value of 16 points may be chosen from other endorsed Training Packages and accredited courses where those units are available for inclusion at Certificate III. Note that the elective units listed below include all of the units that are approved for selection from the MEM Training Package for use 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.

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

Only select units that would be suitable for Mechanical Trade occupational outcomes.

***Additional qualification descriptors***

The following additional descriptors are approved for use with this qualification:  
Refrigeration and Air Conditioning; Instrumentation; Maintenance; Patternmaking; Toolmaking; Watchmaking; Machining.

**Core 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

Unit code	Unit title
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
MSAENV272B	Participate in environmentally sustainable work practices

## Elective Units

### Group A - Mechanical Trade stream units

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

Unit code	Unit title	P
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



<b>Unit code</b>	<b>Unit title</b>	<b>P</b>
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	4

Unit code	Unit title	P
	sharpening/maintenance of production tools and cutters	
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
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

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>
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

Unit code	Unit title	P
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
MEM18042C	Diagnose and rectify manual transmissions	4
MEM18043C	Diagnose and rectify automatic transmissions	8
MEM18044C	Diagnose and rectify drive line and final drives	4

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>
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

<b>Unit code</b>	<b>Unit title</b>	<b>P</b>
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

Unit code	Unit title	P
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
MEM18098A	Prepare to perform work associated with fuel system installation and servicing*	2

**Group B - Trade Specialisation units**

- Select units from the Certificate III Trade Specialisation units listed in Appendix 1, Volume 1 of MEM05 to bring the total value of units to at least 73 points, including any prerequisites.
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