Australian Government

MEM80112 Graduate Diploma of Engineering

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MEM80112 Vocational Graduate Diploma of Engineering

Modification History

Release 1 – This qualification supersedes MEM80111. Additional elective units included. Competitive manufacturing (MSACM) units replaced by Competitive Systems and Practices units.

Description

The MEM80112 Vocational Graduate Diploma of Engineering is a qualification for people with responsibility and accountability for engineering-related design and/or development, leadership or operations across a range of industries and disciplines. The work environment may be project based or relate to an ongoing senior paraprofessional role as a technical specialist or technical leader.

The MEM80112 Vocational Graduate Diploma of Engineering is designed to build upon existing expertise and provides high level specialist engineering design and engineering technical and project management skills.

The MEM80112 Vocational Graduate Diploma of Engineering can also provide an articulation pathway to professional qualifications.

Job roles/employment outcomes

The MEM80112 Vocational Graduate Diploma of Engineering provides the skills and knowledge for people performing the role of a Principal Technical Officer or equivalent in a range of engineering disciplines. Job roles related to this qualification may include engineering leadership roles, project planning, product development, research and development, project management, operations management, engineering related design and other engineering related technical roles requiring the exercising of engineering related skills of a complex and sophisticated nature or skills in a particular field of technical work.

The MEM80112 Vocational Graduate Diploma of Engineering qualification satisfies the requirements for employment as a Principal Technical Officer under relevant Awards and Agreements. Individuals seeking further information on the relationship of this qualification to the Principal Technical Officer classification should seek advice from their relevant industrial organisation.

Pathways Information

Pathways into the qualification

Pathways for candidates considering this qualification may include:

- a Diploma or Advanced Diploma of Engineering from the MEM05 Metal and Engineering Training Package
- significant relevant vocational training and/or work experience.

Pathways from the qualification

After achieving this qualification, candidates may undertake a Bachelor of Engineering or

other suitable higher education qualifications.

Additional qualification advice

Units of competency selected from other Training Packages must be relevant to the work outcome, local industry requirements and the qualification level.

Many units of competency in this qualification assume a level of English, mathematics and science equivalent to a school sector Year 12 standard.

Note: Manufacturing Skills Australia recommends that the design of any training delivery and assessment program to support the achievement of this qualification is based on the context required by the industry and/or enterprise.

Licensing/Regulatory Information

There is no direct link between this qualification and licensing, legislative and/or regulatory requirements.

Entry Requirements

Entry requirements for the MEM80112 Vocational Graduate Diploma of Engineering are:

- an Advanced Diploma of Engineering or a Diploma of Engineering, or a
- relevant Certificate IV or Certificate III together with significant relevant vocational practice in an engineering related role, or a
- Bachelor Degree; or other higher education qualification, with relevant vocational practice in an engineering related role.
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Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• Establish parameters to the brief or contract and provide initial advice • Communicate and negotiate with project stakeholders and contributors • Communicate with support professionals and technicians • Establish visual performance indicators • Motivate personnel • Review proposal with client to improve outcomes and overcome possible problems

	• Negotiate adjustments to brief or contract • Obtain sign-off
Teamwork	• Coordinate the work of others, general and specialist, for projects that require complex and specialised knowledge to achieve objectives • Research and respond to organisational behaviour and management theory • Maintain a database of professional, trades and industry contacts • Establish and maintain continuous improvement teams
Problem-solving	• Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level • Develop continuous improvement processes • Implement problem solving and decision making tools, including root cause analysis and solution evaluation techniques
Initiative and enterprise	• Initiate, analyse, design, plan, execute and evaluate major functions either broad and/or highly specialised within highly varied and/or highly specialised contexts • Generate a range of solutions using appropriate innovation, creativeness and conceptual skills • Establish and maintain project or operations management systems
Planning and organising	• Optimise the implementation plan and schedule • Establish the budget and control measures for project or operations management to conform to the financial business plan • Establish physical resources requirements • Establish human resources and skills development requirements • Establish and maintain records of operations or project for accountability against project objectives, schedule and budget • Maintain a plan and schedule of priorities for project or operations activities • Establish and maintain records of legislative compliance • Coordinate project functions, including planning, budgeting and strategy
Self-management	• Demonstrate full responsibility and accountability for personal outputs • Establish personal responsibilities for significant operations or projects • Establish, maintain and perform personal priorities • Establish and pursue a personal professional development

	program
Learning	• Demonstrate the self-directed development and achievement of broad and/or highly specialised areas of knowledge and skills building on prior knowledge and skills • Establish human resources and skills development requirements • Research and respond to organisational behaviour and management theory • Research industrial and related law • Research financial management techniques • Research knowledge, skills and techniques appropriate to chosen technical electives, mechanical, fluid power, hydrodynamic, thermodynamic, electrical, PLC and microcontroller techniques, computer simulation, differential equations, machine design, noise and vibration, manufacturing and maintenance management techniques
Technology	• Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and/or highly specialised or varied contexts • Develop knowledge, skills and techniques appropriate to chosen technical electives, mechanical, fluid power, hydrodynamic, thermodynamic, electrical, PLC and microcontroller techniques, computer simulation, differential equations, machine design, noise and vibration, manufacturing and maintenance management techniques • Calibrate equipment, take measurements and analyse results • Use software for modelling, human machine interfaces, graphical user interfaces, and networks for data handling and control

Packaging Rules

The MEM80112 Vocational Graduate Diploma of Engineering requires achievement of **ten (10)** units in accordance with the following rules:

- **three (3)** core units of competency
- **seven (7)** elective units of competency.

Elective selection must include:

- a minimum of four (4) Group A elective units
- three (3) remaining elective units may be selected from any combination of:
  - Group A elective units

- Group B elective units
- units from any nationally endorsed Training Packages and accredited courses that are packaged at a Vocational Graduate Certificate or Vocational Graduate Diploma level.

NOTE: Units marked with an asterisk (*) have prerequisite unit/s which must be completed either before or concurrently with the listed unit.

Core units of competency

- Complete the following **three (3)** units of competency.

Unit code	Unit title
MEM234002A	Integrate engineering technologies
MEM234035A	Maintain and apply technical and engineering skills
MSAENV672B	Develop workplace policy and procedures for environmental sustainability

Elective units of competency

Group A

Select a minimum of **four (4)** elective units of competency from the following list.

Unit code	Unit title
MEM234001A	Plan and manage engineering-related projects or operations
MEM234003A	Design machines and ancillary equipment
MEM234004A	Design for engineering-related noise and vibration mitigation
MEM234005A	Design hydrodynamic pumping systems
MEM234006A	Evaluate and select thermodynamic systems or sub-systems
MEM234007A	Design fluid power systems
MEM234008A	Design plant using computer simulations

MEM234009A	Design computer-integrated manufacturing systems
MEM234010A	Design microcontroller applications
MEM234011A	Design programmable logic controller applications
MEM234012A	Design integrated maintenance management systems
MEM234013A	Plan and design engineering-related manufacturing processes
MEM234014A	Design a robotic system
MEM234015A	Design hydronic heat exchanger systems
MEM234016A	Design refrigeration systems
MEM234017A	Design exhaust, ventilation and dust collection systems
MEM234018A	Design heating, ventilation, air conditioning and refrigeration control systems
MEM234019A	Apply finite element analysis in engineering design
MEM234020A	Coordinate small lot manufacture using rapid manufacture processes
MEM234021A	Apply statistics to technology problems
MEM234022A	Apply advanced calculus to technology problems
MEM234023A	Apply differential equations to technology problems
MEM234024A	Apply advanced mathematics in technology problems
MEM234025A	Apply numerical methods to technology problems
MEM234026A	Develop and coordinate engineering-related contingency plans
MEM234027A	Plan and manage materials supply for an engineering project or manufacturing operation
MEM234028A	Produce and manage technical documentation
MEM234029A	Produce and manage technical publications
MEM234030A	Provide specialised technical and engineering guidance to other technical employees
MEM234031A	Manage installation, commissioning or modification of machines and equipment

MEM234032A	Manage fluid power related technologies in an enterprise
MEM234033A	Lead engineering-related quality operations in an enterprise
MEM234034A	Manage heating, ventilation, air conditioning and refrigeration systems or projects
MSS407012A	Lead a problem solving process to determine and solve root cause
MSL976003A	Evaluate and select appropriate test methods and/or procedures

Group B

A maximum of three (3) elective units of competency may be selected from the following list, Group A units not already chosen or units from other endorsed Training Packages where the units are available in a Vocational Graduate Certificate or Vocational Graduate Diploma.

Unit code	**Unit title**
MEM23063A	Select and test mechanical engineering materials*
MEM23064A	Select and test mechatronic engineering materials*
MEM23111A	Select electrical equipment and components for engineering applications*
MEM23112A	Investigate electric and electronic controllers in engineering applications*
MEM23113A	Evaluate hydrodynamic systems and system components*
MEM23114A	Evaluate thermodynamic systems and components*
MEM23115A	Evaluate fluid power systems*
MEM23116A	Evaluate programmable logic controller and related control system component applications*
MEM23117A	Evaluate microcontroller applications*
MEM23118A	Apply production and service control techniques*
MEM23119A	Evaluate continuous improvement processes*

MEM23120A	Select mechanical machine and equipment components*
MEM23121A	Analyse loads on frames and mechanisms*
MEM23122A	Evaluate computer integrated manufacturing systems*
MEM23123A	Evaluate manufacturing processes
MEM23124A	Measure and analyse noise and vibration*
MEM23125A	Evaluate maintenance systems*
MEM234036A	Apply configuration management procedures in engineering management*
MEM234037A	Perform maintenance-related integrated logistic support management activities*
MEM234038A	Apply systems engineering procedures to engineering design project management
BSBLED705A	Plan and implement a mentoring program
BSBLED706A	Plan and implement a coaching strategy
BSBLED710A	Develop human capital
BSBREL701A	Develop and cultivate collaborative partnerships and relationships
MSS407013A	Review continuous improvement processes
MSS407001A	Prepare for and implement change
MSS407002A	Review operations practice tools and techniques
MSS407003A	Analyse process changes
MSS407004A	Facilitate improvements in the internal value stream
MSS407005A	Undertake a qualitative review of a process change
MSS407006A	Build relationships between teams in an operations environment
MSS407007A	Respond to a major non-conformance
MSS407008A	Capture learning from daily activities in a organisation
MSS407009A	Facilitate improvements in the external value stream

MSS407010A	Improve visual management in the workplace
MSS407011A	Manage benchmarking studies
MSS408008A	Analyse data for relevance to organisational learning
MSS408001A	Develop the competitive systems and practices approach
MSS408002A	Audit the use of competitive tools
MSS408003A	Develop models of future state operations practice
MSS408004A	Develop the value stream
MSS408005A	Develop the learning processes of the operations organisation
MSS408006A	Develop and refine systems for continuous improvement in operations
MSS408007A	Develop problem solving capability of an organisation
MSS405007A	Introduce competitive systems and practices to a small or medium enterprise
MSS405020A	Develop quick changeover procedures
MSS405022A	Design a process layout
MSS405023A	Develop a levelled pull system for operations and processes
MSS405032A	Analyse cost implications of maintenance strategy

Custom Content Section

Not applicable.