

National Course Code: MEM60111

Course qualification and name: Advanced Diploma of Engineering (Mechanical)

Course Number: 10391 **Version:** 2

Course Outcomes:

This course is designed for people who are employed, or are seeking employment in the Metal and Engineering industry as engineering associates able to carry out engineering functions.

Students will gain mandatory units of competency in:

- * organising and communicating information
- * interacting with computing technology
- * selection of common engineering materials
- * basic mathematics
- * performing engineering activities
- * self-management

In addition, they will gain knowledge and skills in elective units in such areas as:

- * computer aided drafting (CAD)
- * engineering design
- * engineering management
- * project management

If students complete this course with the support of their employer, it would be expected that they would be employed in positions at level C3 in the Metal, Engineering and Associated Industries Award.

The Advanced Diploma of Engineering (Mechanical) is a qualification in the Metal and Engineering Training Package MEM05.

Students who complete this course could expect to be employed as design drafters, engineering associates, project assistants and related jobs where they support professional Engineers. Associates should be able to supervise other people, solve problems and make decisions that affect others.

Licensing/Regulatory Requirements

There are no specific licences that relate to this qualification. However, for employment at para-professional levels in the aeronautical and avionic fields in the Australian aviation industry, the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA) have requirements that must be met. Units designed to meet these requirements are included as electives in this qualification. Advice on the selection of electives to meet ADF and CASA requirements is given at the end of this qualification.

What you must do to complete the course:

The course structure below shows what you must do to complete this course. The units/modules are arranged in groups and sometimes also in subgroups.

You must complete each group as specified as well as following the course completion instructions. If a course contains optional groups there will be a statement at the top of the course indicating how many you must do. At the top of any group containing optional subgroups there will be a statement saying

how many you must do.

Please note: This course specialises in Mechanical. Please speak to your teacher if you wish to specialise in Aeronautical or Avionics, or if you prefer a general qualification with no specialisation.

This course reflects the packaging requirements for MEM60111 Advanced Diploma of Engineering (specialising in Mechanical), within the Metal and Engineering Training Package (MEM05 V8.1). The rules from MEM05 v8.1 are as follows:

The minimum requirements for achievement of the Advanced Diploma of Engineering are:

- completion of the seven core units of competency listed, and
- completion of 23 elective units, to bring the total number of units to 30.

Group A and Group B elective units must be selected as follows:

- up to eight general elective units from the list in Group A
- at least 15 specialist elective units from Group B, to bring the total number of elective units to 23.

Note that when selecting elective units any prerequisite units must also be completed and count towards the required number of elective units (refer to units and prerequisites listing in Appendix 2).

Five appropriate Group B electives may be chosen from other endorsed Training Packages and accredited courses where those units are available for inclusion at Advanced Diploma.

Note that the Group A and B 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.

To satisfy the Training Package requirements, this TAFE NSW course has been structured as follows:

30 units must be completed - 7 core plus 23 electives

Group 1 - Core Units

All 7 units must be completed

Group 2 - Group A General Elective Units Listed in MEM60111

Up to eight (8) units may be completed

Group 3 - Group B Specialist Elective Units Listed in MEM60111

At least fifteen (15) units must be completed. You may select all 23 electives from this group.

Group 4 - Advanced Diploma units from other Training Packages and accredited courses

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No more than five (5) units may be completed.

Group 997 - Enrichment and Prerequisite units

This group contains enrichment and/or pre-requisite units that can not be counted in the number of units required for course completion. They provide additional skills and knowledge related to your learning area AND/OR are pre-requisites for electives in this qualification but do not contribute to course completion.

NOTES FOR STUDENTS

1. LEARNER SUPPORT

Students who require support to meet their learning goals may co-enrol in the Learner Support course (TAFE Course Number 9999). Talk to your teacher if you think you may require learner support.

2. SELECTION OF ELECTIVES

Talk to your teacher and/or workplace trainer to ensure that your combination of electives provides you with a suitable vocational outcome.

3. RECOGNITION

If you have completed other relevant training you may be eligible to have units of competency from previous training counted towards completion for this course. Talk to your teacher or workplace trainer if you think you may be eligible for recognition for units previously completed.

4. PREREQUISITE UNITS

Some units in this course may have prerequisites that must be completed in a lower level qualification or selected as part of this course. Refer to the Training Package or consult your teacher for information about prerequisites to elective units.

Course Elective Completion:

At least 23 elective modules/units must be completed. These may be chosen from groups 2, 3, 4

Group 1 CORE UNITS

All module/units must be completed

NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM16006A	Organise and communicate information	18
MEM16008A	Interact with computing technology	18
MEM22001A	Perform engineering activities	36
MEM22002A	Manage self in the engineering environment	36
MEM30007A	Select common engineering materials	36
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	36
MSAENV272B	Participate in environmentally sustainable work practices	20

Group 2 GROUP A GENERAL ELECTIVE UNITS LISTED IN MEM60111

No more than 8 module/units may be completed

NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM12024A	Perform computations	27

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NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM13013B	Work safely with ionizing radiation	36
MEM15001B	Perform basic statistical quality control	18
MEM18001C	Use hand tools	18
MEM24001B	Perform basic penetrant testing	18
MEM24003B	Perform basic magnetic particle testing	18
MEM24005B	Perform basic eddy current testing	18
MEM24007B	Perform ultrasonic thickness testing	18
MEM24009B	Perform basic radiographic testing	18
MEM30005A	Calculate force systems within simple beam structures	72
MEM30006A	Calculate stresses in simple structures	36
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	36
MEM30009A	Contribute to the design of basic mechanical systems	36
MEM30010A	Set up basic hydraulic circuits	36
MEM30011A	Set up basic pneumatic circuits	36
MEM30013A	Assist in the preparation of a basic workplace layout	36
MEM30014A	Apply basic just in time systems to the reduction of waste	36
MEM30015A	Develop recommendations for basic set up time	36
MEM30016A	Assist in the analysis of a supply chain	36
MEM30017A	Use basic preventative maintenance techniques and tools	36
MEM30018A	Undertake basic process planning	36
MEM30019A	Use resource planning software systems in manufacturing	36
MEM30020A	Develop and manage a plan for a simple manufacturing related project	36
MEM30021A	Prepare a simple production schedule	36
MEM30022A	Undertake supervised procurement activities	36
MEM30023A	Prepare a simple cost estimate for a manufactured	36
MEM30024A	Participate in quality assurance techniques	36
MEM30025A	Analyse a simple electrical system circuit	36
MEM30026A	Select and test components for simple electronic switching and timing circuits	36
MEM30027A	Prepare basic programs for programmable logic	36
MEM30028A	Assist in sales of technical products/systems	36
MEM30031A	Operate computer-aided design (CAD) system to produce basic drawing elements	54
MEM30032A	Produce basic engineering drawings	72
MEM30033A	Use computer-aided design (CAD) to create and display 3-D models	36
MSAENV472B	Implement and monitor environmentally sustainable work practices	40

Group 3 GROUP B SPECIALIST ELECTIVE UNITS LISTED IN MEM60111
 At least 15 module/units must be completed

NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM09141A	Represent mechanical engineering designs	54
MEM09142A	Represent mechatronic engineering designs	54
MEM09151A	Apply computer aided modelling and data management techniques to mechanical engineering designs	54
MEM09152A	Apply computer aided modelling and data management techniques to mechatronic engineering designs	54
MEM09204A	Produce basic engineering detail drawings	72
MEM09205A	Produce electrical schematic drawings	72
MEM12005B	Calibrate measuring equipment	54
MEM12022B	Program coordinate measuring machines (advanced)	18
MEM12025A	Use graphical techniques and perform simple statistical	18

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NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM12025A	computations	18
MEM13010A	Supervise occupational health and safety in an industrial work environment.	36
MEM14001B	Schedule material deliveries	72
MEM14002B	Undertake basic process planning	72
MEM14003B	Undertake basic production scheduling	72
MEM14061A	Plan and design mechanical engineering projects	72
MEM14062A	Plan and design mechatronic engineering projects	72
MEM14063A	Plan and design manufacturing engineering projects	72
MEM14064A	Plan and design maintenance engineering projects	72
MEM14081A	Apply mechanical engineering fundamentals to support design and development of projects	36
MEM14082A	Apply mechatronics fundamentals to support design and development of engineering projects	36
MEM15007B	Conduct product and/or process capability studies	54
MEM15008B	Perform advanced statistical quality control	18
MEM15010B	Perform laboratory procedures	72
MEM15011B	Exercise external quality assurance	54
MEM15012B	Maintain/supervise the application of quality procedures	36
MEM18016B	Analyse plant and equipment condition monitoring results	36
MEM22003A	Manage engineering resources	54
MEM22004A	Manage engineering projects	54
MEM22005A	Manage engineering operations	36
MEM22006A	Source and estimate materials	36
MEM22007A	Manage environmental effects of engineering activities	54
MEM22008A	Manage change and technical development	36
MEM22009A	Manage technical sales and promotion	36
MEM23001A	Apply advanced mathematical techniques in a manufacturing engineering or related environment	36
MEM23002A	Apply calculus in engineering situations	36
MEM23003A	Operate and program computers and/or controllers in engineering situations	54
MEM23041A	Apply basic scientific principles and techniques in mechanical engineering situations	108
MEM23051A	Apply basic electro and control scientific principles and techniques in mechanical and manufacturing	36
MEM23061A	Select and test mechanical engineering materials	18
MEM23062A	Select and test mechatronic engineering materials	18
MEM23071A	Select and apply mechanical engineering methods, processes and construction techniques	72
MEM23072A	Select and apply mechatronic engineering methods, processes and construction techniques	72
MEM23081A	Apply scientific principles and techniques in mechanical engineering situations	144
MEM23082A	Apply scientific principles and techniques in mechatronic engineering situations	144
MEM23083A	Apply industrial engineering principles and techniques in competitive manufacturing engineering situ	72
MEM23091A	Apply mechanical system design principles and techniques in mechanical engineering situations	54
MEM23092A	Apply automated systems principles and techniques in engineering situations	72
MEM23093A	Apply plant and process design principles and techniques in engineering situations	72
MEM23094A	Apply maintenance systems principles and techniques in engineering situations	72
MEM24002B	Perform penetrant testing	36
MEM24004B	Perform magnetic particle testing	36
MEM24006B	Perform eddy current testing	54

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NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM24008B	Perform ultrasonic testing	54
MEM24010B	Perform radiographic testing	108
MEM24011B	Establish non-destructive tests	108
MEM24012C	Apply metallurgy principles	54
MSACMC410A	Lead change in a manufacturing environment	50
MSACMC610A	Manage relationships with non-customer external	50
MSACMC611A	Manage people relationships	50
MSACMC612A	Manage workplace learning	60
MSACMS400A	Implement a competitive manufacturing system	50
MSACMS401A	Ensure process improvements are sustained	50
MSACMS600A	Develop a competitive manufacturing system	50
MSACMS601A	Analyse and map a value chain	50
MSACMS602A	Manage a value chain	50
MSACMS603A	Develop manufacturing related business plans	50
MSACMS604A	Manage competitive manufacturing processes in a jobbing shop environment	50
MSACMT230A	Apply cost factors to work practices	50
MSACMT260A	Use planning software systems in manufacturing	50
MSACMT261A	Use SCADA systems in manufacturing	50
MSACMT280A	Undertake root cause analysis	50
MSACMT421A	Facilitate a Just in Time (JIT) system	50
MSACMT430A	Improve cost factors in work practices	50
MSACMT432A	Analyse manual handling processes	50
MSACMT440A	Lead 5S in a manufacturing environment	50
MSACMT450A	Undertake process capability improvements	50
MSACMT451A	Mistake proof a production process	50
MSACMT452A	Apply statistics to processes in manufacturing	50
MSACMT460A	Facilitate the use of planning software systems in manufacturing	50
MSACMT461A	Facilitate SCADA systems in a manufacturing team or work area	50
MSACMT481A	Undertake proactive maintenance analyses	50
MSACMT482A	Assist in implementing a proactive maintenance strategy	50
MSACMT620A	Develop quick changeover procedures	50
MSACMT621A	Develop a Just in Time (JIT) system	50
MSACMT622A	Design a process layout	80
MSACMT623A	Develop a levelled pull system of manufacturing	50
MSACMT630A	Optimise cost of product	50
MSACMT631A	Undertake value analysis of product costs in terms of customer requirements	50
MSACMT640A	Manage 5S system in a manufacturing environment	50
MSACMT650A	Determine and improve process capability	50
MSACMT652A	Design an experiment	50
MSACMT660A	Develop the application of enterprise systems in	50
MSACMT661A	Determine and establish information collection requirements and processes	50
MSACMT670A	Develop and manage sustainable energy practices	50
MSACMT671A	Develop and manage sustainable environmental practices	50
MSACMT675A	Facilitate the development of a new product	50
MSACMT681A	Develop a proactive maintenance strategy	50
MSACMT683A	Adapt a proactive maintenance strategy for a seasonal or cyclical manufacturing operation	50
MSAENV672B	Develop workplace policy and procedures for	50

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Group 4 ADVANCED DIPLOMA UNITS FROM OTHER TP OR ACCREDITED COURSES
 No more than 5 module/units may be completed

NSW Module/Unit	Module/Unit Name	Nominal Hours
BSBOHS603B	Analyse and evaluate OHS risk	30
MSS405004A	Develop business plans in an organisation implementing competitive systems and practices	50
MSS405005A	Manage competitive systems and practices responding to individual and unique customer orders	50
MSS405007A	Introduce competitive systems and practices to a small or medium enterprise	50
MSS405021A	Develop a Just in Time system	50

Group 997 ENRICHMENT

You may choose modules/units from this group but they do not count towards course completion

NSW Module/Unit	Module/Unit Name	Nominal Hours
MEM09002B	Interpret technical drawing	36
MEM12003B	Perform precision mechanical measurement	18
MEM12023A	Perform engineering measurements	45
MEM13002B	Undertake occupational health and safety activities in the workplace	27
MEM15004B	Perform inspection	18
MEM15005B	Select and control inspection processes and procedures	36
MEM16010A	Write reports	18
MEM18002B	Use power tools/hand held operations	18
MEM18003C	Use tools for precision work	36
MEM18006C	Repair and fit engineering components	54
MEM18010C	Perform equipment condition monitoring and recording	36
MEM18055B	Dismantle, replace and assemble engineering	27

Requirements to receive the qualification:

To achieve MEM60111 Advanced Diploma of Engineering (specialising in Mechanical)(TAFE NSW course 10391), learners are required to complete 30 units of competency, comprising:

- All 7 core units from Group 1
- 23 elective units from Group 2, 3 and/or 4
- NB: at least 15 elective units must come from Group 3

Recognition:

TAFE recognises the skills and knowledge you have gained through previous studies, work and life experiences. We call this RECOGNITION.

If you are given recognition for a unit/module you do not need to do it. In some cases recognition may allow you to complete your course faster.

If you want to apply for recognition for any unit/module in your course you should obtain a copy of the Recognition Guide for that unit/module and discuss it with your teacher.

More about Assessment

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For information about assessment in TAFE NSW please see "Every Student's Guide to Assessment in TAFE NSW" which is available on the TAFE NSW website at:
http://www.tafensw.edu.au/courses/about/assessment_guide.htm.