



Learner Training Program Guide

BUILD A DRONE PROJECT

MEM20413 Certificate II in Engineering Pathways



MEM20413 Certificate II in Engineering Pathways

Qualification Overview

The qualification is intended for people interested in exposure to an engineering or related working environment with a view to entering into employment in that area. This qualification will equip graduates with knowledge and skills which will enhance their prospects of employment in an engineering or related working environment.

The learning program should develop trade-like skills but not attempt to develop trade-level skills. As an example, the outcome level of welding skills from this qualification is not about learning trade-level welding theory and practice; it is about being introduced to welding, how it can be used to join metal and having the opportunity to weld some metal together.

The focus should be on using engineering tools and equipment to produce or modify objects. This needs to be done in a safe manner for each learner and those around them.

The teachers/trainers must be experienced with the knowledge and trade skills to successfully facilitate and motivate skills development in the learners.

Trainers and assessors must meet the NVR/AQTF trainer and assessor requirements for training and assessment, vocational competency and professional development.

The learning program should be centred around the major project, and in this project it is the building of a high performance drone.

Learner Outcomes

Graduates of a Certificate II will have theoretical and practical knowledge and skills for work and/or further learning.

Knowledge - Graduates of a Certificate II will have **basic factual, technical and procedural knowledge** of a defined area of work and learning.

Skills - Graduates of a Certificate II will have **basic cognitive, technical and communication skills** to apply appropriate methods, tools, materials and readily available information to:

- undertake defined activities
- provide solutions to a limited range of predictable problems

Graduates of a Certificate II will apply knowledge and skills to demonstrate autonomy and limited judgement in structured and stable contexts and within narrow parameters.

Course Outline

To complete MEM20413 Certificate II in Engineering Pathways, the following 12 units of competency must be achieved. As this is designed for school based delivery, the electives have been chosen to best suit the Build a Drone Project.

Should a school/teacher prefer an alternative elective unit of competency that will still result in a successful student graduating with a Certificate II, please contact Leonie Murray on 0438377340 or leonie@skillsgen.com.au.

The course is largely delivered through the completion of three practical projects and some stand alone theory units. This is illustrated in the table below. The practical projects are:

- Metals based project
- Woodwork Project
- Build a Drone Project

Compulsory Units:

The Training Package prescribes the following units as core to this qualification:

MEM13014A	Apply principles of occupational health and safety in the work environment
MEMPE005A	Develop a career plan for the engineering and manufacturing industry
MEMPE006A	Undertake a basic engineering project
MSAENV272B	Participate in environmentally sustainable work practices

Elective Units:

Electives are selected in line with specified Packaging Rules. Skills Generation, in consultation with industry, has specified that certain electives are required to address specific workplace needs.

MEM16006A	Organise and communicate information
MEM16008A	Interact with computing technology
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEMPE001A	Use engineering workshop machines
MEMPE002A	Use electric welding machines
MEMPE007A	Pull apart and re-assemble engineering mechanisms
MSAPMSUP106	Work in a team

Your Trainers and Assessors

Your trainer and assessor for this qualification will be one of your school teachers who holds the appropriate vocational training and assessment qualifications and the current competency to deliver this course.

You are a student of Skills Generation for this course. Should you have any questions, require any learning or other support services or an emergency arises, please contact your designated teacher/trainer.

Feel free also to contact Skills Generation Admin on 1800 838 295. We can also be reached via email on drones@skillsgen.com.au.

Open communication is essential in assisting you in resolving any issues that may arise. We are able to respond to any training related questions or concerns you may have as you progress through the program.

Training and Delivery Strategy

Below is a sample table only. Your teacher will advise you of the particulars of your school's proposed delivery.

Unit Code	Unit Title	Class/Activity
		Course Introduction Build a Drone project Woodwork Project Metal work Project
MEM13014A	Apply principles of occupational health and safety in the work environment	Theory, activities and assessment
MSAPMSUP106A	Work in a team	Theory, activities and assessment
MEM16006A	Organise and communicate information	Theory, activities and assessment
MSAENV272B	Participate in environmentally sustainable work practices	Theory, activities and assessment
MEMPE002A	Use electric welding machines	Project 1: Metal Work Project
MEMPE006A	Undertake a basic engineering project	
MEMPE001A	Use engineering workshop	Project 2: Woodwork Project

MEM18001C	machines Use hand tools	
MEM18002B	Use power tools/hand held operations	
MEMPE007A	Pull apart and re-assemble engineering mechanisms	Project 3: BUILD AND CONFIGURE A DRONE PROJECT Drone Kit issued Parts are inspected and student labels each part for future reference Discussion of function of each part Comparison of position of each component with reference to built drone Re-packed in boxes safely for future use
MEM16008A	Interact with computer technology	Configure the drone for flight: Firmware update ESC and flight controller Access BL Helix software to configure flight controller and radio Access Beta Flight software to configure flight controller and radio Review FC setting and bench test. Range check radio controller
MEMPE005A	Develop a career plan for the engineering and manufacturing industry	A homework assignment around a possible engineering career path

Assessment

Assessment is undertaken throughout this training program. Assessment is competency based and may require the completion of a range of assessment tasks including, for example, written questions, projects and observation.

Your trainer will advise you of any relevant due dates.

Assessment is used to:

- measure your preparedness for further study or attainment of a qualification or statement of attainment
- provide feedback on your learning for both yourself and teachers
- define and protect standards required for a competent outcome
- direct your learning

Effective assessment for a unit or program of study will typically include a mix of assessment types, selected and designed to meet multiple and various industry demands. The assessments for this program have been developed to provide you with an opportunity to demonstrate your skills, knowledge and ability in a range of engineering, manufacturing and technology activities.

Assessment Process

Assessment decisions will be based on your ability to demonstrate competent outcomes for all assessment activities. Competency in the unit will be confirmed on achieving a 'competent' outcome as a result of having satisfactorily completed **all** the assessments in one unit.

The result of each assessment activity is 'satisfactory' or 'not yet satisfactory'. You will have finished the assessment for a unit and be given a unit outcome of 'competent' when you have a satisfactory result for each assessment activity.

If an assessment is deemed 'unsatisfactory', you will be advised what further action you need to take to achieve a satisfactory result. You are given an opportunity to submit additional/alternative work to gain a 'satisfactory' result according to your school's re-sit policies.

While, in general, three re-submissions are allowable, please maintain open communications with your trainer and assessor who will work with you to try to achieve competency. All learners must meet industry standards as described in the unit of competency descriptor and assessment requirements.

When all evidence has been gathered your assessor will make a final judgment and sign off with **C** (Competent) or **NYC** (Not Yet Competent).

Feedback

You will be provided with formal and informal feedback from your trainer at regular intervals throughout this course of study to assist you in this learning process and in gaining competency in the units.

Reasonable Adjustment

Reasonable adjustment refers to measures or actions taken to provide you with the same educational opportunities as everyone else. Ask your trainer to discuss this with you if you feel that adjustments should be made within your training and assessment program.

Recognition of Prior Learning – RPL

Skills recognition benefits learners by recognising skills and knowledge gained from previous studies, informal training or experiences gained at work and in everyday life. This could mean a reduction in the amount of training and assessment required to complete your course.

RPL is a process of the assessment of your skills, knowledge and competencies that relate to your course. If you feel you may be eligible to apply for skills recognition please request further information from your assessor or our administration team at admin@skillsgen.com.au.

Duration of this Course

The volume of learning for a Certificate II is typically 6 to 12 months.

For High School students, this is a one year course incorporated into the curriculum and delivered according to the school's timetabling constraints.

Those learners who can demonstrate and provide evidence of competency, can complete the qualification in a shorter time frame. For self-paced online or distance learners, the duration of the course can be up to two years.

Unless the student is experienced and is eligible to RPL the course in full or in part, this qualification is to be delivered over a period of not less than 6 months and typically within 12 months. This includes the period required for assessment. However, some learners may require additional time and the maximum time permitted for completion is 2 years. Extensions are available as required for participants who remain engaged and continue to make progress.

All school based learners must undertake an LLN test as a requirement of entry into this course. All learners will be able to fully develop the required skills and knowledge prior to being assessed.

Superseded Qualifications

If this qualification is superseded, Skills Generation must transfer continuing learners of the superseded qualification into the replacement qualification as soon as practicable but no later than 12 months from the date of publication of the replacement qualification on the national register, unless the learners will be genuinely disadvantaged.

Additionally, once a replacement qualification is published on the national register, Skills Generation may commence training or assessment of the superseded qualification to a new learner, for a period of 12 months or until it is registered for the replacement qualification (whichever occurs first).

Skills Generation may continue to deliver training and assessment services and issue awards to current learners of the superseded qualification who would be genuinely disadvantaged if required to transfer to the replacement qualification, for up to 6 months after the expiry of the transition period for its replacement.

Qualification Issued

Successfully completing all the units of competency within this course will lead to the issuance of a MEM20413 Certificate II in Engineering Pathways. As well as the Certificate, participants will receive a Record of Results of all completed units and a congratulatory letter.

Students who partially complete the qualification will be issued with a Statement of Attainment, a Record of Results and a congratulatory letter.

All Certificates, Statements of Attainment, Records of Results and congratulatory letters are signed by a Director and **no one else**. They are issued in line with the guidelines outlined in the Standards for Registered Training Organisations (RTOs) 2015.

Units of Competency in this Course

Please see below for a brief description for each of the units of competency and links to where you can find out more.

We wish you well in your studies and hope you find it an enjoyable and rewarding experience!

MEM13014A Apply principles of occupational health and safety in the work environment

Application of the Unit Application

This unit covers essential skills and knowledge that underpin all units within the Metal and Engineering Training Package. The unit applies to working in the engineering, manufacturing or similar industries. Competencies demonstrated would be associated with performance of duties and use of specialist skills.

This unit and these standards do not cover the skills of emergency teams such as fire fighting, first aid officer etc.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEM13014A>

MEMPE005A Develop a career plan for the engineering and manufacturing industry

Application of the Unit Application

This unit is designed for use in a pre-employment skills introduction program and is suitable for use in institutional-based vocational programs. Skills development will take place under direct supervision.

This unit is not to be used in a traineeship or apprenticeship training program or associated qualifications. It is only to be used in pre-employment programs and carries no credit towards apprenticeship/trade and other qualification types in manufacturing and engineering.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEMPE005A>

MEMPE006A Undertake a basic engineering project

Application of the Unit Application

This unit is designed for use in a pre-employment skills introduction program and is suitable for use in institutional based vocational programs. Skills development will take place under direct supervision.

This unit is not to be used in a traineeship or apprenticeship training program or associated qualifications. It is only to be used in pre-employment programs and carries no credit towards apprenticeship/trade and other qualification types in manufacturing and engineering.

This unit should be integrated with the skills development undertaken through other units in this qualification.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEMPE006A>

MSMENV272B Participate in environmentally sustainable work practices

Application of the Unit Application

This competency applies to operators/team members who are required to follow procedures so as to work in an environmentally sustainable manner. This ensures regulatory compliance and also aims at minimising environmental risks and maximises the environmental performance of the process and the organisation.

It includes:

- Resources used
- Potential environmental hazards
- Improving environmental performance (within scope of competency and authority).

This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MSAENV272B>

MEM16006A Organise and communicate information

Application of the Unit **Application**

This unit applies in manufacturing, engineering or related environments.

It may include information related to production, maintenance or associated processes. Information may be drawn from a variety of sources.

This unit includes the ability to communicate using common workplace terminology.

For access and recording of data requiring system knowledge and judgement, see Unit MEM16008A (Interact with computing technology).

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEM16006A>

MEM16008A Interact with computing technology

Application of the Unit **Application**

This unit applies in manufacturing, engineering or related environments. It involves identifying the type and source of information required, and using the technology to access, input and store information. The equipment may include computers and a range of other equipment based on computing technology.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEM16008A>

MEM18001C Use hand tools

Application of the Unit Application

Applications may include hand tools used for adjusting, dismantling, assembling and finishing of items or components, and the finishing, cutting, scraping of metallic and non-metallic material to size and shape. This includes simple tapping and threading and routine maintenance of hand tools.

This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used.

When using hand held power tools or power tools used for hand held operations, refer to Unit MEM18002B (Use power tools/hand held operations).

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEM18001C>

MEM18002B Use power tools/hand held operations

Application of the Unit Application

This unit applies to loosening and fastening items or components and shaping, finishing, cutting, grinding metallic and non-metallic materials and/or tool bits to size and shape.

This unit should not be selected if the power tools used are dedicated to an operation or machine, e.g. nut-runner, air drill, power driver, etc.

For using hand tools, see Unit MEM18001C (Use hand tools).

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEM18002B>

MEMPE001A Use engineering workshop machines

Application of the Unit Application

This unit is designed for use in a pre-employment skills introduction program and is suitable for use in institutional-based vocational programs. Skills development will take place under direct supervision.

This unit is not to be used in a traineeship or apprenticeship training program or associated qualifications. It is only to be used in pre-employment programs and carries no credit towards apprenticeship/trade and other qualification types in manufacturing and engineering.

This unit should be integrated with the work in the project unit, *MEMPE006A Undertake a basic engineering project*, and skills developed when required by the project.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEMPE001A>

MEMPE002A Use electric welding machines

Application of the Unit Application

This unit is designed for use in a pre-employment skills introduction program and is suitable for use in institutional-based vocational programs. Skills development will take place under direct supervision.

This unit is not to be used in a traineeship or apprenticeship training program or associated qualifications. It is only to be used in pre-employment programs and carries no credit towards apprenticeship/trade and other qualification types in manufacturing and engineering.

This unit should be integrated with the work in the project unit, *MEMPE006A Undertake a basic engineering project*, and skills developed when required by the project.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEMPE002A>

MEMPE007A Pull apart and re-assemble engineering mechanisms

Application of the Unit Application

This unit is designed for use in a pre-employment skills introduction program and is suitable for use in conjunction with institutional-based vocational programs. Skills development will take place under direct supervision.

This unit is not to be used in a traineeship or apprenticeship training program or associated qualifications. It is only to be used in pre-employment programs and carries no credit towards apprenticeship/trade and other qualification types in manufacturing and engineering.

This unit could be integrated with the work in the project unit, *MEMPE006A Undertake a basic engineering project*, and skills developed when required by the project. It would certainly be integrated with the development of skills for the unit *MEM1800B Use hand tools* and could be used to enhance the research learning about components in the project unit.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MEMPE007A>

MSAPMSUP106 Work in a team

Application of the Unit Application

This competency is typically performed by people who work within a team structure with limited discretionary powers

The worker will:

- plan and organise activities in accordance with instructions
- use appropriate interpersonal skills to contribute to effective teamwork
- seek assistance from other team members where appropriate
- complete logs and reports.

For more detailed information, refer to:

<http://training.gov.au/Training/Details/MSAPMSUP106>