

# Course Flyer

## MEM31922 Certificate III in Engineering – Fabrication Trade



**SUPERIOR  
TRAINING  
CENTRE**  
RTO ID Number 41122 Cricos Provider 03591C

## Course Description

This qualification defines the skills and knowledge required of an engineering tradesperson - fabrication within metal, engineering, manufacturing, and associated industries. The qualification has been specifically developed to meet the needs of apprentices in the above trade.

This qualification must be undertaken through a Training Contract or through formal trade recognition assessment processes.

The skills associated with this qualification are intended to apply to a wide range of fabrication work, including undertaking metal fabrication, structural steel erection, sheet metal work, welding.

This qualification is designed to provide an industry-recognised skills profile related to trade work as an Engineering Tradesperson - Fabrication.

Assessment of some units of competency must, where indicated, include evidence of the candidate's performance in a functioning workplace 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.

No licensing, legislative, or certification requirements apply to this qualification at the time of publication. However, in some jurisdictions, units in this qualification may relate to licensing or regulatory requirements. Local regulations should be checked.

## Job Roles and Career Pathways

The qualification is designed for students wishing to enter the Metal and engineering industry for roles including undertaking metal fabrication, structural steel erection, sheet metal work, welding, blacksmithing and surface finishing. This course covers relevant employability skills. Full details can be found at <https://training.gov.au/Training/Details/MEM31922>

## Entry Requirements

### Course entry

There are no formal course entry requirements into this qualification.

### RTO entry

Superior Training Centre recommends the following:

Language, literacy and numeracy skills levels necessary to adopt the knowledge and be successful in completing the units within this qualification



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### Apprenticeship Students

Superior Training Centre specific course entry requirements for MEM31922 Certificate III in Engineering Fabrication Trade for Apprenticeship students are as follows:

- Students should be either employed full time as an apprentice in the electrotechnology industry.
- Students should be signed up with an Apprentice Network Provider and have a Training Plan Proposal

### Numeracy and Literacy

Upon enrolment all students must take Language literacy and numeracy test as part of entry requirements. Students who need to improve their language and literacy skills must undertake a Smart and Skilled training for people who want extra learning support course to gain the required language level prior to commencement into MEM31922 Certificate III in Engineering Fabrication Trade.

## Intake

Course start dates are as listed on the RTO training schedule.

## Further Learning

Students obtaining competencies for all units in this course will be awarded the full qualification MEM31922 - Certificate III in Engineering - Fabrication Trade. Students not obtaining a competent result for all units in this course will receive a Statement of Attainment.

Graduates of this course may continue their vocational education by undertaking a Diploma level course from the MEM- Manufacturing, and Engineering Package such as the MEM50119 - Diploma of Engineering - Advanced Trade or other relevant.

## Course Structure

To be awarded the [MEM31922](#) Certificate III in Engineering – Fabrication Trade, units of competency to the value of 96 points must be achieved, chosen as outlined below:

- all core units of competency listed below (totalling 33 points)
- elective units of competency to a minimum value of 40 points from Groups A, B, C, D, E, F and G as described below
- elective units of competency to a maximum value of 23 points from Group H to bring the total value to 96 points.



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CORE UNITS		POINTS
<b>All Core Units of Competency are to be achieved</b>		
MEM09002	Interpret technical drawing	4
MEM11011	Undertake manual handling	2
MEM12023	Perform engineering measurements	5
MEM12024	Perform computations	3
MEM13015	Work safely and effectively in manufacturing and	2
MEM14006	Plan work activities	4
MEM16006	Organise and communicate information	2
MEM16008	Interact with computing technology	2
MEM17003	Assist in the provision of on-the-job training	2
MEM18001	Use hand tools	2
MEM18002	Use power tools/hand held operations	2
MSMENV272	Participate in environmentally sustainable work practices	3
<b>Total points in Core</b>		<b>33</b>
<b>ELECTIVE UNITS</b>		
<b>Fabrication Trade stream units – the qualification to group A, B, C, D, E requirement</b>		
MEM05004	Perform routine oxy fuel gas welding	2
MEM05005	Carry out mechanical cutting	2
MEM05007	Perform manual heating and thermal cutting	2
MEM05010	Apply fabrication, forming and shaping techniques	8
MEM05089	Assemble fabricated components	8
MEM05012	Perform routine manual metal arc welding	2
MEM05090	Weld using manual metal arc welding process	4
MEM05091	Weld using gas metal arc welding process	4
MEM05073	Perform advanced welding using gas metal arc welding process	4
MEM05092	Weld using gas tungsten arc welding process	4
MEM05037	Perform geometric development	6
MEM05049	Perform routine gas tungsten arc welding	2
MEM05050	Perform routine gas metal arc welding	2
MEM05085	Select welding processes	2
MEM05052	Apply safe welding practices	4
MEM08010	Manually finish/polish materials	6
MEM12007	Mark off/out structural fabrications and shapes	4
<b>Total points in Elective</b>		<b>66</b>

Please refer to Volume of Learning, Duration and Delivery sequence for unit delivery sequence and hours allocated



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### Core Units Syllabus

Subject	Outcome (Required Skills & Knowledge)
<b>MEM09002 - Interpret technical drawing (CORE)</b>	<ul style="list-style-type: none"> <li>○ Understand how to follow work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Understand how to select, check and validate technical drawing against job requirements or equipment.</li> <li>○ Skills in interpreting technical drawing through recognition of components, assemblies, objects and symbols</li> <li>○ Understand how to identify dimensions</li> <li>○ Understand how to apply drawing conventions appropriate to engineering discipline</li> <li>○ Understand how to compile a materials list.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand application of AS 1100 Technical drawing or AS 1102 Graphical symbols</li> <li>○ Understand conventions used in technical drawings</li> <li>○ Understand correct interpretation of instructions contained in drawings</li> <li>○ Understand materials from which drawing object(s) are made and their features and manufacturing and assembly requirements.</li> </ul>
<b>MEM11011- Undertake manual handling (CORE)</b>	<ul style="list-style-type: none"> <li>○ Understand how to work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Understand how to assess the risks associated with lifting materials manually and determining the most appropriate technique</li> <li>○ Understand how to select and use the appropriate equipment to move/shift materials ensuring safety of personnel and security of material.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand manual handling techniques, including individual or team lifting</li> <li>○ Understand appropriate equipment associated with move/shift materials</li> <li>○ Understand hazards of incorrect procedures</li> <li>○ Understand Safe Work Australia standards for manual handling.</li> </ul>



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<b>MEM12023- Perform engineering measurements (CORE)</b>	<ul style="list-style-type: none"> <li>○ Understand how to follow work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Understand how to identify and interpret measurement requirements from specifications</li> <li>○ Understand how to select appropriate measuring device or equipment to achieve the required outcome</li> <li>○ Understand how to obtain measurements in a safe and effective manner and recording measurements, including preparing a freehand sketch which depicts required information, as required</li> <li>○ Understand how to perform calculations to determine or verify dimensions</li> <li>○ Skills in storing and maintaining measuring devices including routine adjustments according to manufacturer's specifications or SOPs.</li> <li>○ Understand safe work practices and procedures</li> <li>○ Understand correct application of a range of measuring devices</li> <li>○ Understand correct and appropriate measuring technique for a range of measuring devices</li> <li>○ Understand calculations, including addition, subtraction, multiplication, division, fractions and decimals</li> <li>○ Understand manufacturer's or SOPs for handling and storing a range of measuring devices</li> <li>○ Understand appropriate procedures for adjusting and zeroing a range of measuring devices, including scale adjustment</li> <li>○ Understand appropriate methods of communicating measurements by drawings.</li> </ul>
<b>MEM12024 - Perform computations (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in obtaining and interpreting data from job instructions and relevant sources to establish required outcomes</li> <li>○ Skills in determining the appropriate calculation method to suit the application</li> <li>○ Skills in performing calculations and confirming answer/s</li> <li>○ Skills in producing and interpreting simple charts and graphs from given data.</li> <li>○ Understand safe work practices and procedures</li> <li>○ Understand formulae applicable to the determination of perimeter, area and volume of simple geometric shapes and the reasons for using dimensions with the same units</li> <li>○ Understand techniques and procedures for rounding off figures when estimating approximate answers</li> <li>○ Understand features and use of mixed numbers, decimals, fractions and whole numbers</li> <li>○ Understand procedures for carrying out calculations involving fractions and using each of the four basic rules of addition, subtraction, multiplication and division</li> <li>○ Understand concept of percentage and procedures to be followed in converting a decimal and fraction to a percentage</li> <li>○ Understand concepts and calculations of ratio and proportion</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Understand scales applicable to the axes of the graphs or charts</li> <li>○ Understand types of charts and/or graphs used in the individual's field of work</li> <li>○ Understand upper and lower limits of acceptability applicable to data entered on a graph or chart</li> <li>○ Understand trends indicated by the slope or gradient of a graph</li> <li>○ Understand action to be taken when given trends occur or set limits are approached on graphs or charts</li> <li>○ Understand procedures for drawing 'lines of best fit'</li> <li>○ Understand trends indicated by the graphs or charts drawn</li> </ul>
<b>MEM13015 - Work safely and effectively in manufacturing and engineering (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and avoiding or controlling hazards</li> <li>○ Skills in reporting hazards, incidents, injuries and other work health and safety (WHS) non-conformances following SOPs</li> <li>○ Skills in recognising and responding to emergencies following SOPs</li> <li>○ Skills in identifying and obtaining, instructions and information on job requirements, including one or more of the following: verbal or written job instructions, specifications, SOPs, charts, lists.</li> <li>○ Skills in identifying and responding to contingencies, including: equipment breakdowns, non-conforming components, safety hazards</li> <li>○ Skills in recording information into proforma workplace documents, including: production tally form, quality control forms, safety incident forms</li> <li>○ Skills in performing assigned tasks and checking outcome of own work for conformance to specifications</li> <li>○ Skills in identifying own responsibilities within the workplace quality system</li> <li>○ Skills in giving and receiving feedback on own and group work</li> <li>○ Skills in seeking assistance from supervisors and mentors.</li> <li>○ Understand safe work practices and procedures and use and application of personal protective equipment</li> <li>○ Understand basic quality system terminology and concept, including: quality assurance, quality control, quality improvement</li> <li>○ Understand procedures to be followed in performing own work</li> <li>○ Understand objectives, requirements and specifications to which the individual's work is to comply</li> <li>○ Understand costs and consequences of poor quality</li> <li>○ Understand effective interpersonal skills: effective listening, basic speaking skills, use of workplace terminology and jargon, giving and receiving feedback, checking and clarifying task-related information, verbal, visual and written instructions, appropriate modes and methods of communication</li> <li>○ Understand barriers to effective communication</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Understand sources of technical expertise/assistance</li> <li>○ Understand hazards and control measures associated with workplace activities.</li> </ul>
<b>MEM14006 - Plan work activities (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in planning a work activity using appropriate planning tools and techniques whilst following established procedures, including work health and safety (WHS) requirements</li> <li>○ Skills in checking the plan to ensure accuracy and conformance and modifying the plan components, as necessary, to overcome any unforeseen difficulties or developments</li> <li>○ Skills in identifying hazards and implementing appropriate risk control measures and procedures</li> <li>○ Skills in selecting, using and maintaining relevant personal protective equipment (PPE)</li> <li>○ Skills in evaluating the effectiveness of risk controls measures</li> <li>○ Skills in providing proforma WHS reports in accordance with SOPs, as required.</li> <li>○ Understand safe work practices and procedures and use of PPE</li> <li>○ Understand relevant specifications</li> <li>○ Understand sources of advice relating to the objectives, requirements and specifications</li> <li>○ Understand timeframe for activity completion</li> <li>○ Understand quality requirements of the product or service</li> <li>○ Understand techniques and reasons for prioritising of each step in a plan</li> <li>○ Understand modifications that can be made to the plan to respond to unforeseen developments</li> <li>○ Understand risk control measures</li> <li>○ Understand reporting requirements for accidents, incidents and other non-conformances with WHS procedures.</li> </ul>
<b>MEM16006 - Organise and communicate information (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in accessing and recording relevant information from a range of sources</li> <li>○ Skills in recognising and using workplace appropriate terminology</li> <li>○ Skills in reading, interpreting and following information in workplace documentation</li> <li>○ Skills in checking and clarifying information</li> <li>○ Skills in organising, categorising and sequencing information</li> <li>○ Skills in communicating using appropriate methods and procedures for a variety of situations.</li> <li>○ Understand safe work practices and procedures</li> <li>○ Understand types of information relevant to the workplace and required tasks</li> <li>○ Understand terminology used in the workplace relevant to own work</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Understand available sources of information</li> <li>○ Understand information analysis techniques appropriate to tasks and position</li> <li>○ Understand methods of categorising and organising information including correct sequencing of information</li> <li>○ Understand methods of recording and communicating information.</li> </ul>
<b>MEM16008 - Interact with computing technology (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in accessing, inputting, manipulating and storing information using workplace computing technology whilst following standard procedures</li> <li>○ Skills in accessing assistance, where required.</li> <li>○ Understand safe work practices and procedures</li> <li>○ Understand functions and capabilities of computing technology used in the workplace</li> <li>○ Understand functions of software applications</li> <li>○ Understand use and features of data outputs.</li> </ul>
<b>MEM17003 - Assist in the provision of on-the-job training (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in determining through consultation the objectives of training and the role of on-the-job training</li> <li>○ Skills in planning training delivery</li> <li>○ Skills in conducting appropriate training in a safe and effective manner, including the appropriate use of personal protective equipment (PPE)</li> <li>○ Skills in using appropriate training methods</li> <li>○ Skills in monitoring trainee's progress and providing feedback</li> <li>○ Skills in reporting trainee's progress through appropriate channels.</li> <li>○ Understand safe work practices and procedures and use of PPE</li> <li>○ Understand requirements for planning occasional on-the-job training</li> <li>○ Understand features of training with relevant personnel, including: identification of person(s) to be trained, the individual's role in the provision of training, skills and knowledge to be learned, procedures to be followed, training location(s), tools, equipment, materials and resources required, appropriate delivery method/s, the role of feedback in the provision of on-the-job training, the reasons for monitoring trainee's progress, reporting procedures</li> </ul>
<b>MEM18001 - Use hand tools (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in selecting and using hand tools to produce the desired outcome to job specifications</li> <li>○ Skills in following designated procedures for dealing with unsafe or faulty tools</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Skills in undertaking routine maintenance and cleaning of hand tools, including storage.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand features and applications of different hand tools used in a general engineering context, including hacksaws, hammers, punches, screwdrivers, sockets, wrenches, scrapers, chisels, gouges, wood planes and files of all cross-sectional shapes and sizes</li> <li>○ Understand common faults and/or defects in hand tools</li> <li>○ Understand procedures for marking unsafe or faulty tools for repair</li> <li>○ Understand routine maintenance requirements for a range of hand tools, including lubricating, tightening, simple tool repairs and adjustments using engineering principles and relevant equipment</li> <li>○ Understand storage location and procedures for a range of hand tools.</li> </ul>
<b>MEM18002 - Use power tools/hand held operations (CORE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in selecting and using a range of hand held and fixed power tools for a variety of general engineering applications</li> <li>○ Skills in following designated procedures for dealing with unsafe or faulty power tools</li> <li>○ Skills in undertaking routine maintenance and cleaning of power tools, including storage.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand features and application of different power tools</li> <li>○ Understand clamping/securing methods</li> <li>○ Understand adjustments/alignments to a range of power tools</li> <li>○ Understand common faults and/or defects in power tools</li> <li>○ Understand procedures for marking unsafe or faulty power tools for repair</li> <li>○ Understand routine maintenance requirements and cleaning of a range of power tools</li> <li>○ Understand storage location and procedures of a range of power tools.</li> </ul>
<b>MSMENV272 - Participate in environmentally sustainable work practices (CORE)</b>	<ul style="list-style-type: none"> <li>○ Understand followed environmental policies and identified potential breaches of environmental regulations and suggested improvements within the limit of own authority.</li> <li>○ Understand environmental sustainability issues relevant to organisation</li> <li>○ Understand resource use and impact of inefficiencies associated with own work role</li> <li>○ Understand environmental and resource efficiency policies and procedures for own work role</li> <li>○ Understand environmental regulations and guidelines and their impact on own work role</li> </ul>



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	<ul style="list-style-type: none"> <li>Understand the environmental issues, hazards and risks associated with own work role</li> </ul>
<b>MEM05004 - Perform routine oxy fuel gas welding (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>Skills in cleaning and preparing materials for welding</li> <li>Skills in setting up: gas cylinders, hoses, blowpipes, tips and nozzles, regulators, flashback arrestors</li> <li>Skills in selecting settings and consumables</li> <li>Understand butt and fillet weld materials to comply with specifications</li> <li>Understand cleaning welds according to SOPs.</li> <li>Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>Understand preparatory requirements</li> <li>Understand equipment and equipment settings</li> <li>Understand purpose of, and setting up requirements, of: gas cylinders, hoses, blowpipes, tips and nozzles, regulators, flashback arrestors</li> <li>Understand fuel gas properties and applications</li> <li>Understand weld characteristics</li> </ul>
<b>MEM05005- Carry out mechanical cutting (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>Selection and use of appropriate cutting equipment and tools, such as guillotines, band saws, power hacksaws, and oxy-fuel cutting systems</li> <li>Workplace health and safety (WHS) requirements for mechanical cutting, including hazard identification and risk assessment</li> <li>Safe operation and maintenance of mechanical cutting machinery</li> <li>Interpretation of technical drawings, cutting lists, and job specifications</li> <li>Calculation of material allowances, tolerances, and waste reduction techniques</li> <li>Proper handling, storage, and identification of different metals and materials</li> <li>Cutting techniques for ferrous and non-ferrous metals, composites, and other materials</li> <li>Adjustments and settings for cutting machines to ensure accuracy and quality</li> <li>Procedures for setting up workpieces, securing materials, and using clamps and guides</li> <li>Common faults and troubleshooting in mechanical cutting operations</li> <li>Correct disposal and recycling of waste materials according to environmental regulations</li> <li>Post-cutting finishing processes, including deburring and edge treatment</li> </ul>
<b>MEM05010 - Apply fabrication, forming and shaping techniques (ELECTIVES)</b>	<ul style="list-style-type: none"> <li>Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>Skills in selecting relevant tools and equipment to fabricate, form and shape materials</li> <li>Skills in setting up and safely operating equipment</li> <li>Skills in forming and shaping materials</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Skills in performing calculations associated with allowances for shrinkage, thickness and inside/outside measurements</li> <li>○ Skills in checking final product for compliance with specifications</li> <li>○ Skills in rectifying defects.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand hot and cold forming/shaping processes</li> <li>○ Understand machines, tools and equipment required to perform forming/shaping processes and reasons for selection</li> <li>○ Understand equipment adjustments that can be made and the effect on the object being formed/shaped</li> <li>○ Understand calculations to determine allowances</li> <li>○ Understand machine and equipment operation</li> <li>○ Understand material positioning/feeding requirements</li> <li>○ Understand location and function of all safety guards</li> <li>○ Understand defects in formed/shaped materials and required rectification by further work/adjustment.</li> </ul>
<b>MEM05011 - Assemble fabricated components (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in constructing necessary jigs</li> <li>○ Skills in planning fabricated component assembly tasks and sequences efficiently and effectively</li> <li>○ Skills in aligning material in jigs and using fixtures, tools and equipment as necessary to check the position of all assembled components visually and dimensionally</li> <li>○ Skills in marking datum lines in an appropriate manner</li> <li>○ Skills in positioning and assembling general fabricated components in accordance with drawing/specifications using accepted engineering trade techniques, practices, processes and workplace procedures either on-site or in a fabrication workshop</li> <li>○ Skills in applying appropriate distortion control techniques and checking to ensure compliance of the final assembly with specifications.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand methods and techniques for assembly of fabricated components</li> <li>○ Understand jig construction</li> <li>○ Understand effects of distortion of fabricated components and distortion prevention techniques</li> <li>○ Understand uses and interpretation of drawings, specifications and material lists</li> <li>○ Understand characteristics of relevant tools and equipment for determining squareness, level and alignment</li> <li>○ Understand function and determination of datum lines</li> <li>○ Understand fixing/joining techniques, including: welding, adhesives, fasteners, rivets</li> </ul>



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	<ul style="list-style-type: none"> <li>Understand defects associated with the assembly of fabricated components and methods of rectification of defects by rework or adjustment</li> </ul>
<b>MEM05012 - Perform routine manual metal arc welding (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>Skills in identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for performing routine manual metal arc welding (MMAW)</li> <li>Skills in cleaning and preparing materials to specifications</li> <li>Skills in setting up welding equipment, selecting appropriate electrodes and adjusting settings to suit application</li> <li>Skills in welding materials to comply with specifications</li> <li>Skills in cleaning welds for slag and splatter in accordance with SOPs.</li> <li>Skills in safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>Understand material and equipment preparation</li> <li>Understand equipment set-up and settings</li> <li>Understand appropriate welding consumables consistent with standard operating procedures</li> <li>Understand MMAW processes and properties.</li> </ul>
<b>MEM05015 - Weld using manual metal arc welding process (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>Skills in identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for welding using manual metal arc welding process (MMAW) to the specified standard</li> <li>Skills in selecting appropriate weld and joint preparation methods</li> <li>Understand consistently weld a range of materials to the specified standard or equivalent using AC or DC welding machines and electrodes while preventing distortion</li> <li>Skills in rectifying any defects</li> <li>Skills in completing weld records related to MMAW onto standard workplace forms.</li> <li>Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>Understand material preparation for MMAW</li> <li>Understand weld joint preparations</li> <li>Understand welding electrode classification</li> <li>Understand causes of distortion for materials when welded</li> <li>Understand causes of weld defects and methods of rectification</li> <li>Understand relationships between amperage, electrode and material</li> <li>Understand standards for MMAW, including AS 1554 General Purpose any other equivalent standards.</li> </ul>



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<p><b>MEM05017 - Weld using gas metal arc welding process (ELECTIVE)</b></p>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for welding using gas metal arc welding process (GMAW) to the specified standard</li> <li>○ Skills in selecting appropriate weld and joint preparation methods</li> <li>○ Skills in consistently weld materials to the specified standard or equivalent using AC or DC welding machines and electrodes while preventing distortion</li> <li>○ Skills in rectifying any defects</li> <li>○ Skills in completing weld records related to GMAW onto standard workplace forms.</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand types of gases and their uses</li> <li>○ Understand relationships between amperage/wire feed, voltage, gas flow, electrode and material</li> <li>○ Understand application of weld metal transfer (short arc and spray)</li> <li>○ Understand correct welding machine, leads, hand pieces and electrodes</li> <li>○ Understand material preparation</li> <li>○ Understand weld joint preparations</li> <li>○ Understand filler wire classification</li> <li>○ Understand causes of distortion for materials when welded</li> <li>○ Understand causes of weld defects and methods of rectification</li> <li>○ Understand standards for GMA welding, including Australian Standard 1554 General Purpose and any other equivalent standard.</li> </ul>
<p><b>MEM05018 - Perform advanced welding using gas metal arc welding process (ELECTIVE)</b></p>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for performing advanced welding using gas metal arc welding (GMAW) process to AS 1554 Structural Purpose</li> <li>○ Skills in selecting appropriate weld and joint preparation methods</li> <li>○ Skills in consistently weld materials to AS 1554 Structural Purpose or equivalent using AC or DC welding machines and electrodes while preventing distortion</li> <li>○ Skills in rectifying any defects</li> <li>○ Skills in completing and maintaining weld records related to GMAW Structural Purpose onto standard workplace forms.</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand in-depth knowledge of the properties and characteristics of a wide range of materials</li> <li>○ Understand requirements to conform to AS 1554 Structural Purpose or equivalent</li> <li>○ Understand weld procedures and requirements</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Understand different welder identification systems, including numbering, bar coding, paint coding and letter stamps</li> <li>○ Understand causes of weld defects and methods of rectification.</li> </ul>
<b>MEM05019 - Weld using gas tungsten arc welding process (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures and safe work practices</li> <li>○ Skills in identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for welding using gas tungsten arc welding process (GTAW) to the specified standard</li> <li>○ Skills in selecting appropriate weld and joint preparation methods</li> <li>○ Skills in consistently weld materials to the specified standard using AC or DC welding machines and electrodes while preventing distortion</li> <li>○ Skills in rectifying any defects</li> <li>○ Skills in completing weld records related to GTAW onto standard workplace forms.</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand correct welding machine, leads, hand pieces and electrodes</li> <li>○ Understand material preparation</li> <li>○ Understand joint preparations</li> <li>○ Understand electrode classification</li> <li>○ Understand causes of distortion for materials when welded</li> <li>○ Understand causes of defects and methods of rectification</li> <li>○ Understand relationships between amperage, electrode and material</li> <li>○ Understand types of gases and their uses</li> <li>○ Understand types of electrodes, current settings and high frequency voltage</li> <li>○ Understand filler materials and consumables</li> <li>○ Understand standards for GTAW welding, AS 1554 General Purpose and other equivalent standards.</li> </ul>
<b>MEM05037 - Perform geometric development (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in examining detailed drawings for fabrication requirements and specifications, including materials, measurements and tolerances, joining methods, standards and code requirements</li> <li>○ Skills in calculating allowances for fabrication and assembly</li> <li>○ Skills in establishing and marking datum points</li> <li>○ Skills in selecting and using parallel line, radial line and triangulation development methods with minimum material wastage and accurate dimensions</li> <li>○ Skills in producing templates accurately and following storage procedures.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand specifications of work</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Understand tools and equipment</li> <li>○ Understand development preparation, methods and application</li> <li>○ Understand datum points</li> <li>○ Understand materials used for the preparation of templates</li> <li>○ Understand manufacturing allowance considerations</li> <li>○ Understand template development, labelling, identification and storage requirements</li> <li>○ Understand fabrication and assembly allowances</li> <li>○ Understand sources of data on fabrication and relevant standards and codes.</li> </ul>
<b>MEM05049 - Perform routine gas tungsten arc welding (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and interpreting specifications from sketches and verbal or written job instructions for performing routine gas tungsten arc welding (GTAW)</li> <li>○ Skills in cleaning and preparing materials for welding to specifications</li> <li>○ Skills in setting up welding equipment, including selecting settings and consumables to suit application</li> <li>○ Skills in consistently welding materials to specifications</li> <li>○ Skills in cleaning welds in accordance with SOPs.</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand preparatory requirements</li> <li>○ Understand equipment and equipment settings</li> <li>○ Understand shielding gas properties and applications</li> <li>○ Understand weld characteristics.</li> </ul>
<b>MEM05050 - Perform routine gas metal arc welding (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures and safe work practices</li> <li>○ Skills in identifying and interpreting specifications from sketches and verbal or written job instructions for performing routine gas metal arc welding (GMAW)</li> <li>○ Skills in cleaning and preparing materials for welding to specifications</li> <li>○ Skills in setting up welding equipment, including selecting settings and consumables to suit application</li> <li>○ Skills in consistently welding materials to specifications</li> <li>○ Skills in cleaning welds in accordance with SOPs.</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand different current and voltage settings, gas flow rates wire diameters, wire feed speed and other variables to suit typical situations</li> <li>○ Understand material and equipment preparation</li> <li>○ Understand properties and characteristics of materials and consumables</li> <li>○ Understand equipment and equipment settings</li> <li>○ Understand shielding gas properties and applications</li> <li>○ Understand post-welding treatments</li> <li>○ Understand weld characteristics.</li> </ul>



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<b>MEM05051 - Select welding processes (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying properties of common used metals</li> <li>○ Skills in identifying potential contingencies and considering solutions</li> <li>○ Skills in identifying and selecting appropriate welding process and the effects of the welding process on materials</li> <li>○ Skills in identifying processes for cleaning and preparing metals and the role of contaminants in welding flaws</li> <li>○ Understand safe welding practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand properties and characteristics of commonly used metals and materials</li> <li>○ Understand basic metallurgy principles associated with alloys and grades of metals</li> <li>○ Understand uses and purposes of various metals</li> <li>○ Understand distortion prevention measures for various metals</li> <li>○ Understand different types of electrodes</li> <li>○ Understand hazards associated with the use of chemicals and the fumes emitted by welding processes.</li> </ul>
<b>MEM05052 - Apply safe welding practices (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and interpreting work health and safety (WHS) information and legislation</li> <li>○ Skills in identifying risks and hazards associated with welding</li> <li>○ Skills in implementing risk control measures and procedures, including using appropriate manual handling techniques and personal protective equipment (PPE)</li> <li>○ Skills in reporting workplace non-compliances in accordance with workplace procedures.</li> <li>○ Understand safe welding practices and procedures and use of PPE</li> <li>○ Understand characteristics and properties of common metals and welding materials</li> <li>○ Understand effect of gas and electrical welding operations on metals</li> <li>○ Understand effect of various treatments on a range of commonly used metals</li> <li>○ Understand WHS information and sources</li> <li>○ Understand work-related safety information</li> <li>○ Understand pollutants present as a result of welding activities</li> <li>○ Understand all the welding processes, including equipment and material requirements</li> <li>○ Understand hazards associated with welding processes and methods to minimise those hazards.</li> </ul>
<b>MEM08010 - Manually finish/polish materials (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in selecting appropriate finishing process, media and equipment to manually finish metal and plastic materials</li> </ul>



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	<ul style="list-style-type: none"> <li>○ Skills in installing and setting up grinding and polishing devices and equipment</li> <li>○ Skills in assessing the surface condition of materials to determine the necessary finishing treatment</li> <li>○ Skills in safely applying techniques, including grinding, brushing and/or polishing to meet specifications.</li> <li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li> <li>○ Understand surface finishing specifications</li> <li>○ Understand procedures, tools and techniques for fitting and adjusting endless belts on finishing machines</li> <li>○ Understand procedures, tools and techniques required to fit and dress grinding wheels and mops</li> <li>○ Understand procedures tools and techniques for installing and setting up polishing mops</li> <li>○ Understand characteristics of common metals, alloys and plastics relevant to finishing work</li> <li>○ Understand finishing and polishing methods/techniques and the appropriate polishing media to be used in finishing/polishing for different types of materials</li> <li>○ Understand effect of different types and grades of polishing media on the surface finish</li> <li>○ Understand reasons for selecting a specific method/technique</li> <li>○ Understand common surface imperfections/defects and how they can be removed/repaired by manual finishing/polishing procedures</li> <li>○ Understand procedures for handling components with surface imperfections/defects that cannot be removed/repaired</li> <li>○ Understand methods and techniques to check for conformance to finishing specifications.</li> </ul>
<b>MEM12007 - Mark off/out structural fabrications and shapes (ELECTIVE)</b>	<ul style="list-style-type: none"> <li>○ Skills in following work instructions, standard operating procedures (SOPs) and safe work practices</li> <li>○ Skills in identifying and interpreting specifications and drawings for fabrication requirements, including materials, measurements and tolerances, joining methods, standards and code requirements</li> <li>○ Skills in carrying out all marking off/out using appropriate marking out tools and equipment to specifications</li> <li>○ Skills in calculating measurements not shown on drawings, as required</li> <li>○ Skills in establishing and marking datum points</li> <li>○ Skills in selecting appropriate template material and producing templates to specifications</li> <li>○ Skills in storing templates, including labelling and identification, to procedures, as required</li> <li>○ Skills in developing patterns by selecting and applying appropriate development and/or measurement sequence and determining correct allowances for fabrication and assembly and transferring these measurements</li> </ul>



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|  | <ul style="list-style-type: none"><li>○ Skills in calculating allowances for fabrication and assembly, including shrinkage, thickness and inside/outside measurements, and transferring these measurements</li><li>○ Skills in identifying and estimating quantities of materials from drawings with minimise wastage.</li><li>○ Understand safe work practices and procedures and use of personal protective equipment (PPE)</li><li>○ Understand procedures for marking off/out and pattern development</li><li>○ Understand tools and equipment to be used in the preparation of the marking off/out</li><li>○ Understand datum points</li><li>○ Understand materials that can be used for the preparation of templates and their application</li><li>○ Understand manufacturing allowances that have to be considered when developing patterns</li><li>○ Understand template labelling and identification procedures and storage requirements of templates</li><li>○ Understand appropriate methods of development/marketing off/out of a range of given objects</li><li>○ Understand appropriate fabrication and assembly allowances</li><li>○ Understand effects of material type and thickness on fabrication and assembly allowances</li><li>○ Understand sources of data on fabrication and assembly allowances</li><li>○ Understand relevant standards and codes and the meaning of symbols used</li><li>○ Understand requirements of the codes/standards applicable to the work to be done</li><li>○ Understand materials from which the component/assembly is to be manufactured</li><li>○ Understand benefits of minimising material wastage.</li></ul> |
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## MEM31922 Certificate III in Engineering – Fabrication Trade

### Volume of Learning



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The volume of learning allocated to this qualification includes all teaching, learning and assessment activities that are required to be undertaken by the targeted student to achieve the learning outcomes of this qualification.

The volume of learning for MEM31922 - Certificate III in Engineering - Fabrication Trade as a certificate III level qualification is typically delivered over 1 – 2 years (1200 – 2400 hours) based on the unit of competency selection and the identified target market.

The Volume of Learning is 1,288 hours consisting of scheduled delivery, self-paced study; and 2,340 hours of workplace evidence additional to scheduled hours.

#### Duration

Total duration for MEM31922 - Certificate III in Engineering - Fabrication Trade is 3,628 hours over 112 weeks as follows:

- 92 weeks delivery and assessment
  - 736 hours scheduled mandatory face-to-face classes (8 hours per week during term time: theory, tutorial, assessment, practical – classroom and simulated Boilermaker & welder environment)
  - 276 hours online learning (3 hours per week during term time)
  - 276 hours self-paced learning (3 hours per week during term time)
  - 2,340 minimum hours approximately of workplace training (It is expected that the learner completes a minimum of 15 hrs per week over the duration of the course of 52 weeks for 3 years)
- 20 weeks break

The volume of learning allocated to a qualification will vary depending on the level of the qualification and the experience and competency of the student. Students must complete the allocated hours for the qualification they are undertaking in order to achieve competency. If the student applies for RPL or Credit Transfer, the volume of learning may be reduced.

## Delivery

This qualification is delivered twenty (14) hours per week, over a hundred and five (92) weeks.

Note: This course duration does not include workplace (on the job-training) hours but is required to obtain the qualification MEM31922 - Certificate III in Engineering - Fabrication Trade.

This qualification is delivered to Apprenticeship students fulltime integrating the following blended modes of delivery:

- Scheduled face to face class hours
- Online learning hours
- Self-study



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## Assessment Methods

Assessment is structured throughout the course. If students are unable to achieve competency, additional support is provided through mentoring and access to re-assessment as outlined in our policies and procedures. Assessment requires achievement across all tasks to demonstrate competence and includes:

- Written Assessment
- Simulated/Practical Assessment (demonstration of skills)
- Portfolio of Evidence including Third party Report\*

*\*Supplementary and Indirect workplace evidence: Successful completion of this course will require students to submit a portfolio of work performed, additional evidence will be asked to the student to support competence in the unit: referee testimonials and employment history declaration.*

## Recognition of Prior Learning (RPL)

Students who have completed corresponding units of competency and/or units contained within the packaging rules can apply for Credit Transfer. RPL evidence must include some of the following:

- Work Experience
- Life Experience
- Previous Study e.g. qualifications, industry training
- Professional Development Programs and/or Courses

## Resources

Students will be provided with the following resource handouts required to complete the Certificate III in Engineering – Fabrication Trade upon enrolment:

- Marking-Off Techniques for Metal Fabrication by CEC Cox and Graham Myer
- Welding and Metal Fabrication by Larry Jeffus

## Relevant Industry Standards

Superior Training Centre's delivery and assessment of the Certificate III in Engineering complies with the following Australian standards:

- AS4100 Steel structures standard
- AS1100 Technical drawing
- AS/NZS 4600:2018 | Cold-formed Steel Structures



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## Total Course Fees

This training is subsidised by the NSW Government under the Smart and Skilled program. Additional fees may apply for books and Exemplar Profiling.

## Campus Details and Facilities

Superior Training Centre is located at Level 1/8 Oxford Rd, Ingleburn NSW 2565.

The campus at Ingleburn provides quality teaching and learning facilities for students. The training facilities have been set up to run classroom based training sessions, to support the learning and assessment programs we offer.

The campus includes well-appointed facilities that offer a comfortable learning environment.

## Library Services

Ingleburn Library is available to students to assist them with their study. The library is located at 76 Oxford Rd, Ingleburn NSW 2565 and is just a 15 minute walk from the campus.

## How to Apply

Please contact Superior Training Centre by:

☎ +61 2 9618 6809

✉ [info@stc.nsw.edu.au](mailto:info@stc.nsw.edu.au)



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## Important Information – Student Handbook, Policies and Procedures, Fees and Charges

Information about our training and assessment policies and procedures are included on our website [www.stc.nsw.edu.au](http://www.stc.nsw.edu.au) and should be read by you, prior to enrolment in addition to the Student Handbook which is also located on our website. These documents contain important information about your training course, fees and charges including our refund policy.

## Identification of Student Needs and Student Support

Student needs are declared by the applicant at the time of enrolment: the application form allows the applicant to self-declare where they have learning disabilities.

Every student is interviewed either face to face or over the telephone to attempt to establish the applicant skill and knowledge levels, their current employment and how that relates to the course content and interaction.

Where language literacy and numeracy are in question, Superior Training Centre has a language literacy and numeracy assessment they may undertake to confirm their level of language, literacy and numeracy skills.

Reasonable adjustments to training and assessment will be made and additional support (e.g. LLN, assistive technology, additional training, alternative delivery and assessment modes and methods) provided where students with physical attributes or specific learning needs are identified as requiring these changes to complete their training and assessment.