Metal Trades Skills

Certificate 1 Engineering

METAL TRADES A – WELDING AND FABRICATION
Skills Set from Certificate 2 in Engineering
MEM20105
30 Stage 1 credits
(10 Stage 1 credits if Metal Trades B (Machine Operations) has been completed)
Course Length: 1 semester

PREFERRED BACKGROUND
An ESL scale of at least 6 is desirable.

COURSE DESCRIPTION
This practical course focuses on the joining and welding of metals using a range of processes including induction welding, oxy-acetylene welding (OAW) Manual Metal Arc (MMAW) and Gas Metal Arc (GMAW). Students will also be introduced to some introductory hand tool exercises and sheet metal working processes. There will be a strong emphasis on safety and students are expected to wear appropriate clothing and footwear.

This course can be done before or after Metal Trades B – Machine Operation and Mechanical Principles to make up a full year’s study. The two programs should be seen as complimentary to each other to maximize SACE points as well as increase skills related to manufacturing and engineering related industries.

COURSE CONTENT
- Workshop safety
- Fabrication methods and practice
- Welding methods and practice
- Hand and power tools
- Tool maintenance
- Grinding and drilling
- Employability skills
- Work preparation
- Project planning
- Quality procedures
- Manual handling of equipment and materials
- Workshop calculations
- Workshop communication
- Review questions
- Online information searches
- Workshop classes will occupy two full days per week.
- Students will also study SACE Stage 1 Trade Maths and Trade Communication subjects.
- Other SACE courses should be selected to make up a full-time program.

Students will be assisted in organizing and undertaking an industry work placement during the term breaks.

UNITS OF COMPETENCE
(Nominal hours are shown in brackets)
Core Units
MEM16007A Work with others in a manufacturing, engineering or related environment (20)
MEM13014B Apply principles of OHS in a work environment (10)
MEM14004A Plan to undertake a routine task (10)
MEM15024A Apply quality procedures (18)
Specialization Units for Welding & Mechanical Streams
MEM18002B Use power tools/hand held operations (20)
MEM11011B Undertake manual handling (20)
MEM12024A Perform computations (30)
Welding Specialisation Units
MEM05004C Perform routine oxy acetylene welding (20)
ME05012C Perform routine MMAW welding (20)
MEM5007C Perform manual heating and thermal cutting (20)
MEM05050B Perform routine GMAW welding (20)

PATHWAY
For both Metal Trades A and Metal Trades B a pathway to an apprenticeship or Trade Certificate 3.
Metal Trades Skills
Certificate 1 Engineering

METAL TRADES B – MACHINE OPERATIONS AND MECHANICAL PRINCIPLES
Skills Set from Certificate 2 in Engineering
MEM20105
30 Stage 1 credits
(10 Stage 1 credits if Metal Trades A (Welding & Fabrication) has been completed)
Course Length: 1 semester

COURSE DESCRIPTION
This practical course focuses on a range of mechanical principles and metal machining processes related to the field of fitting and turning as well as machine operation and tool making trades. Students will also undertake a range of hand tool and machine exercises using a range of ferrous and non-ferrous metal sections including sheet, flat bar and round and hexagonal solid bar stock. There will be a strong emphasis on safety and students are expected to wear appropriate clothing and footwear. It is highly recommended that students wear overalls whilst operating machine tools.

This course can be done before or after Metal Trades A – Welding and Fabrication to make up a full year’s study. The two programs should be seen as complimentary to each other to maximize SACE points as well as increase skills related to manufacturing and engineering related industries.

COURSE CONTENT
- Workshop safety
- Hand cutting tools and methods
- Mechanical cutting machines and methods
- Hand and power tools
- Tool maintenance and tool sharpening
- Tool and machine setting
- Grinding and drilling
- Milling
- Lathe turning operations
- Engineering measuring instruments
- Power transmission in machine tools – gears and pulleys
- Speed ratios and material cutting speeds
- Employability skills
- Work preparation
- Project planning
- Quality procedures
- Manual handling of equipment and materials
- Workshop calculations
- Workshop communication
- Review questions
- Online information searches

Workshop classes will occupy two full days per week.

Students will also study SACE Stage 1 Trade Maths and Trade Communication subjects. Other SACE courses should be selected to make up a full-time program.

UNITS OF COMPETENCE
(Nominal hours are shown in brackets)

Core Units
MEM16007A Work with others in a manufacturing, engineering or related environment (20)
MEM13014B Apply principles of ohs in a work environment (10)
MEM14004A Plan to undertake a routine task (10)
MEM15024A Apply quality procedures (18)

Specialization Units for Welding & Mechanical Streams
MEM18002B Use power tools/hand held operations (20)
MEM11011B Undertake manual handling (20)
MEM12024A Perform computations (30)

Machine & Mechanical Specialisation Units
MEM18001C Use hand tools (20)
MEM12023A Perform engineering measurements (30)
MEM05005B Carry out mechanical cutting (20)
MEM07032B Use workshop machines for basic operations (20)