

# Engineering Skills

## Applied senior subject

Applied

Technologies are an integral part of society as humans seek to create solutions to improve their own and others' quality of life. Technologies affect people and societies by transforming, restoring and sustaining the world in which we live. In an increasingly technological and complex world, it is important to develop the knowledge, understanding and skills associated with traditional and contemporary tools and materials used by the Australian manufacturing industry to produce products. The manufacturing industry transform raw materials into products wanted by society. This adds value for both enterprises and consumers. Australia has strong manufacturing industries that continue to provide employment opportunities.

Engineering Skills includes the study of the manufacturing and engineering industry's practices and production processes through students' application in, and through trade learning contexts. Industry practices are used by manufacturing enterprises to manage the manufacture of products from raw materials. Production processes combine the production skills and procedures required to produce products. Students engage in applied learning to demonstrate knowledge and skills in units that meet local needs, available resources and teacher expertise. Through both individual and collaborative learning experiences, students learn to meet customer expectations of product quality at a specific price and time.

Applied learning supports students' development of transferable 21st century, literacy and numeracy skills relevant to future employment opportunities in the structural, transport and manufacturing engineering industrial sectors. Students learn to interpret drawings and technical information, and select and demonstrate safe practical production processes using hand and power tools, machinery and

equipment. They communicate using oral, written and graphical modes, organise, calculate, plan, evaluate and adapt production processes and the products they produce. The majority of learning is done through manufacturing tasks that relate to business and industry. Students work with each other to solve problems and complete practical work.

## Pathways

A course of study in Engineering Skills can establish a basis for further education and employment in engineering trades. With additional training and experience, potential employment opportunities may be found, for example, as a sheet metal worker, metal fabricator, welder, maintenance fitter, metal machinist, locksmith, air-conditioning mechanic, refrigeration mechanic or automotive mechanic.

## Objectives

By the conclusion of the course of study, students should:

- demonstrate practices, skills and procedures
- interpret drawings and technical information
- select practices, skills and procedures
- sequence processes
- evaluate skills and procedures, and structures
- adapt plans, skills and procedures.

## Structure

Engineering Skills is a four-unit course of study. This syllabus contains six QCAA-developed units as options for schools to select from to develop their course of study.

Unit option	Unit title
Unit option A	Fitting and machining
Unit option B	Welding and fabrication
Unit option C	Sheet metal working
Unit option D	Production in the structural engineering industry
Unit option E	Production in the transport engineering industry
Unit option F	Production in the manufacturing engineering industry

## Assessment

Students complete two assessment tasks for each unit. The assessment techniques used in Engineering Skills are:

Technique	Description	Response requirements
Practical demonstration	Students perform a practical demonstration when manufacturing a unit context artefact and reflect on industry practices, and production skills and procedures.	<b>Practical demonstration</b> Practical demonstration: the skills and procedures used in 3–5 production processes <b>Documentation</b> Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media
Project	Students manufacture a unit context product that consists of multiple interconnected components and document the manufacturing process.	<b>Product</b> Product: 1 fitting and machining product manufactured using the skills and procedures in 5–7 production processes <b>Manufacturing process</b> Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media