

Engineering

General senior subject

General

Engineering includes the study of mechanics, materials science and control technologies through real-world engineering contexts where students engage in problem-based learning. Students learn to explore complex, open-ended problems and develop engineered solutions. They recognise and describe engineering problems, determine solution success criteria, develop and communicate ideas and predict, generate, evaluate and refine real-world-related solutions. Students justify their decision-making and acknowledge the societal, economic and environmental sustainability of their engineered solutions. The problem-based learning framework in Engineering encourages students to become self-directed learners and develop beneficial collaboration and management skills.

Engineering provides students with an opportunity to experience, first-hand and in a practical way, the exciting and dynamic work of real-world engineers. Students learn transferrable 21st century skills that support their life aspirations, including critical thinking, creative thinking, communication, collaboration and teamwork, personal and social skills, and information & communication technologies (ICT) skills. The study of Engineering inspires students to become adaptable and resilient. They appreciate the engineer's ability to confidently and purposefully generate solutions that improve the quality of people's lives in an increasingly complex and dynamic technological world.

Pathways

A course of study in Engineering can establish a basis for further education and

employment in the field of engineering, including, but not limited to, civil, mechanical, mechatronic, electrical, aerospace, mining, process, chemical, marine, biomedical, telecommunications, environmental, micro-nano and systems. The study of engineering will also benefit students wishing to pursue post-school tertiary pathways that lead to careers in architecture, project management, aviation, surveying and spatial sciences.

Objectives

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

- recognise and describe engineering problems, concepts and principles
- symbolise and explain ideas and solutions
- analyse problems and information
- determine solution success criteria for engineering problems
- synthesise information and ideas to predict possible solutions
- generate prototype solutions to provide data to assess the accuracy of predictions
- evaluate and refine ideas and solutions to make justified recommendations
- make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts.

Structure

Unit 1	Unit 2	Unit 3	Unit 4
Engineering fundamentals • Engineering in society • Engineering communication • Introduction to engineering mechanics • Introduction to engineering materials	Emerging technologies • Emerging needs in society • Emerging processes, machinery and automation • Emerging materials	Civil structures • Civil structures in society • Civil structures and forces • Civil engineering materials	Machines and mechanisms • Machines in society • Machines, mechanisms and control • Materials

Assessment

Schools devise assessments in Units 1 and 2 to suit their local context.

In Units 3 and 4 students complete *four* summative assessments. The results from each of the assessments are added together to provide a subject score out of 100. Students will also receive an overall subject result (A–E).

Summative assessments

Unit 3		Unit 4	
Summative internal assessment 1 (IA1): • Engineered solution	25%	Summative internal assessment 3 (IA3): • Engineered solution	25%
Summative internal assessment 2 (IA2): • Examination — combination response	25%	Summative external assessment (EA): • Examination — combination response	25%