



ENGINEERING

General Senior Subject

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 prototype 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.

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 and society <ul style="list-style-type: none"> • Engineering history • The problem-solving process in Engineering • Engineering communication • Introduction to engineering mechanics • Introduction to engineering materials | Emerging technologies <ul style="list-style-type: none"> • Emerging needs • Emerging processes and machinery • Emerging materials • Exploring autonomy | Statics of structures and environmental considerations <ul style="list-style-type: none"> • Application of the problem-solving process in Engineering • Civil structures and the environment • Civil structures, materials and forces | Machines and mechanisms <ul style="list-style-type: none"> • Machines in society • Materials • Machine control |

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).

Formative assessments

| Unit 1 | | Unit 2 | |
|---|-----|---|-----|
| Formative internal assessment 1 (IA1): • Project — folio | 25% | Formative internal assessment 3 (IA3): • Project — folio | 25% |
| Formative internal assessment 2 (IA2): • Examination | 25% | Formative external assessment (EA): • Examination | 25% |

Summative assessments

| Unit 3 | | Unit 4 | |
|---|-----|---|-----|
| Summative internal assessment 1 (IA1): • Project — folio | 25% | Summative internal assessment 3 (IA3): • Project — folio | 25% |
| Summative internal assessment 2 (IA2): • Examination | 25% | Summative external assessment (EA): • Examination | 25% |