




School Code			
Year Level	11 & 12	QCE Credits	4
Subject Type	General Subject	VET Contribution	N/A
Recommended Academic Performance	Science—B Standard General Maths—B Standard Mathematical Methods—C Standard		
21 st Century Skills			

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.

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

Engineering is a General subject suited to students who are interested in pathways beyond school that lead to tertiary studies, vocational education or work. 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, knowledge, 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

Structure:

Unit 1	Unit 2	Unit 3	Unit 4
Today's challenges Topic 1: Engineering history Topic 2: The problem-solving process in Engineering Topic 3: Engineering communication Topic 4: Introduction to engineering mechanics Topic 5: Introduction to engineering materials	Innovation Topic 1: Emerging needs Topic 2: Emerging processes and machinery Topic 3: Emerging materials Topic 4: Exploring autonomy	Civil engineering Topic 1: Application of the problem-solving process in Engineering Topic 2: Civil structures and the environment Topic 3: Civil structures, materials and forces	Real world solutions Topic 1: Machines in society Topic 2: Materials Topic 3: Machine control

Assessment:

Formative assessments provide feedback to both students and teachers about each student's progress in the course of study. Schools develop internal assessments for each senior subject based on the learning described in Units 1 and 2 of the subject syllabus. Each unit objective must be assessed at least once. For reporting purposes, schools should devise at least *two* but no more than *four* assessments for Units 1 and 2 of this subject. At least *one* assessment must be completed for *each* unit. The sequencing, scope and scale of assessments for Units 1 and 2 are matters for each school to decide and should reflect the local context.

Teachers are encouraged to use the A–E descriptors in the reporting standards to provide formative feedback to students and to report on progress.

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%

Costs

It is expected that students studying this subject participate in BYOD. Please see page 155 for further information and device specifications.