




School Code	MAS		
Year Level	11 & 12	QCE Credits	4
Subject Type	General Subject	VET Contribution	N/A
Recommended Academic Performance	Foundation Mathematical Methods—C Standard NB. Those students wanting to study Specialist Mathematics must also take Mathematical Methods. Specialist is recommended for those students who enjoy mathematics.		
21st Century Skills	Communication 	Critical thinking 	Personal and social skills 

Specialist Mathematics is of roughly the same difficulty as Mathematical Methods, however builds on the content taught in Methods. Therefore, students taking Specialist must also choose Mathematical Methods.

Specialist Mathematics' major domains are Vectors and matrices, Real and complex numbers, Trigonometry, Statistics and Calculus.

Specialist Mathematics is designed for students who develop confidence in their mathematical knowledge and ability, and gain a positive view of themselves as mathematics learners. They will gain an appreciation of the true nature of mathematics, its beauty and its power.

Students learn topics that are developed systematically, with increasing levels of sophistication, complexity and connection, building on functions, calculus, statistics from Mathematical Methods, while vectors, complex numbers and matrices are introduced. Functions and calculus are essential for creating models of the physical world. Statistics are used to describe and analyse phenomena involving probability, uncertainty and variation. Matrices, complex numbers and vectors are essential tools for explaining abstract or complex relationships that occur in scientific and technological endeavours.

Student learning experiences range from practising essential mathematical routines to developing procedural fluency, through to investigating scenarios, modelling the real world, solving problems and explaining reasoning.

Pathways:

A course of study in Specialist Mathematics can establish a basis for further education and employment in the fields of science, all branches of mathematics and statistics, computer science, medicine, engineering, finance and economics.

Objectives:

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

- select, recall and use facts, rules, definitions and procedures drawn from Vectors and matrices, Real and complex numbers, Trigonometry, Statistics and Calculus
- comprehend mathematical concepts and techniques drawn from Vectors and matrices, Real and complex numbers, Trigonometry, Statistics and Calculus
- communicate using mathematical, statistical and everyday language and conventions
- evaluate the reasonableness of solutions
- justify procedures and decisions, and prove propositions by explaining mathematical reasoning
- solve problems by applying mathematical concepts and techniques drawn from Vectors and matrices, real and complex numbers, Trigonometry, Statistics and Calculus.

Structure:

Unit 1	Unit 2	Unit 3	Unit 4
Combinatorics, vectors and proof <ul style="list-style-type: none"> • Combinatorics • Vectors in the plane • Introduction to proof 	Complex numbers, trigonometry, functions and matrices <ul style="list-style-type: none"> • Complex numbers 1 • Trigonometry and functions • Matrices 	Mathematical induction, and further vectors, matrices and complex numbers <ul style="list-style-type: none"> • Proof by mathematical induction • Vectors and matrices • Complex numbers 2 	Further statistical and calculus inference <ul style="list-style-type: none"> • Integration and applications of integration • Rates of change and differential equations • Statistical inference

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):	20%	Summative internal assessment 3 (IA3):	15%
<ul style="list-style-type: none"> • Problem-solving and modelling task 		<ul style="list-style-type: none"> • Examination 	
Summative internal assessment 2 (IA2):	15%		
<ul style="list-style-type: none"> • Examination 			
Summative external assessment (EA): 50% <ul style="list-style-type: none"> • Examination 			

Cost:

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

In line with Mathematical Methods, students will need graphics calculator . Hireable from the school at a cost of \$50.00/yr.