

Subject name	Specialist Mathematics
Subject code	MAS
Subject type	General
Subject fee	Nil
Prerequisites	Minimum C Year 10 Semester 2 Maths Methods

Course overview

This subject must be done in conjunction with Mathematical Methods. The reason being, in certain topics it builds on the concepts covered in Mathematical Methods. Specialist Mathematics looks deeper into these concepts to consider the reasons behind the mathematics we use and why it works. Seeking this 'proof' behind the concepts and rules we use in other areas of mathematics is central to Specialist Mathematics.

It also looks at several topics that have an engineering-related focus, and some of the topics do support the learning that occurs in senior Physics. Many topics are pure mathematics and can lead to careers where being a good mathematician is central to the job. Feedback from past students would suggest Specialist Mathematics for the most part is not more difficult than Mathematical Methods. It just means doing more maths, so you would want to really like the subject.

Like Mathematical Methods, another reason students choose Specialist Mathematics is that being *successful* in Specialist Mathematics can contribute to a high ATAR score. However, this statement should come with the qualification that mathematics needs to be a strength and an interest, as *success* will not come without motivation and application.

Course outline

Unit 1	Unit 2	Unit 3	Unit 4
Combinatorics, proof, vectors and matrices <ul style="list-style-type: none"> Combinatorics Introduction to proof Vectors in the plane Algebra of vectors in two dimensions Matrices 	Complex numbers, further proof, trigonometry, functions and transformations <ul style="list-style-type: none"> Complex numbers Complex arithmetic and algebra Circle and geometric proofs Trigonometry and functions Matrices and transformations 	Further complex numbers, proof, vectors and matrices <ul style="list-style-type: none"> Further complex numbers Mathematical induction and trigonometric proofs Vectors in two and three dimensions Vector calculus Further matrices 	Further calculus and statistical inference <ul style="list-style-type: none"> Integration techniques Applications of integral calculus Rates of change and differential equations Modelling motion Statistical inference

Assessment

Assessments in Unit 1 and Unit 2 are formative and are devised to replicate Internal assessments used in Unit 3 and Unit 4. In Unit 3 and Unit 4 students complete four summative assessments. The results from each of the internal assessments are combined with the external assessment result to provide a subject score out of 100. Students will also receive an overall exit subject result from QCAA that is A to E.

Summative assessments

Unit 3		Unit 4	
Summative internal assessment 1 (IA1); (completed in Unit 3 or 4) Problem-solving and modelling task (3 class lessons, maximum 2000 words)			20%
Summative internal assessment 2 (IA2): Examination (90 minutes)	15%	Summative internal assessment 3 (IA3): Examination (90 minutes)	15%
Summative external assessment (EA) covering Units 3 and 4 (2 x 90 minute exams)			50%

Course requirements

Students will be required to purchase or hire a TI-84+CE Graphic Calculator. These are available for purchase at a cost of approximately \$210. They can also be hired from the Textbook Office for \$20 per semester. Other TI-brand graphic calculators are also acceptable choices, like TI-Nspire CXII.

Career opportunities 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.