Subject name	**Mathematical Methods**
Subject code	MAM
Subject type	General
Subject fee	Nil
Prerequisites	Minimum C Year 10 Semester 2 Maths Methods

Course overview

This subject is more technically demanding than General Mathematics and achieving success in Mathematical Methods will prepare students for entry in certain courses where a high level of mathematics is required. If gaining a high ATAR score is required for what a student wishes to do at university, then a good result in Mathematical Methods is more likely to help achieve that higher ATAR score than doing General Mathematics. Put simply, a B in Mathematical Methods will contribute to a higher ATAR score than a B in General Mathematics.

Mathematical Methods does require a high level of algebraic skill, and combines both examining real-life technical applications of mathematics, with looking at the purely abstract patterns of mathematics, needed to develop sophisticated mathematical models.

A common concern expressed by students is that they have to work really hard to be successful in this subject. We would challenge that notion by saying students need to learn to work smarter, not harder. Successful Mathematical Methods students do not necessarily do every question of every exercise. Instead, they look for the differences in questions, and seek a deeper understanding of concepts so they can tackle any problem given to them. That being said, it is a challenging course and should only be chosen by students already demonstrating a reasonably sound level of success in their current Maths Methods Taster subject.

Course outline

Unit 1	Unit 2	Unit 3	Unit 4
Surds, algebra, functions and probability • Surds and quadratic functions • Binomial expansion and cubic functions • Functions and relations • Trigonometric functions • Probability	**Calculus and further functions** • Exponential functions • Logarithms and logarithmic functions • Introduction to differential calculus • Applications of differential calculus • Further differentiation	**Further calculus and introductions to statistics** • Differentiation of exp and log functions • Differentiation of trig functions and differentiation rules • Further applications of differentiation • Introduction to integration • Discrete random variables	**Further calculus, trigonometry and statistics** • Further integration • Trigonometry • Continuous random variables and the normal distribution • Sampling and proportions • Interval estimates for proportions

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 three 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 which contributes to their ATAR score. 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 Units 3 or 4) Problem-solving and modelling task (three 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 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 $20.00 per semester. Other TI brand graphic calculators are also acceptable choices, like TI-Nspire CXII.

Career opportunities

A course of study in Mathematical Methods can establish a basis for further education and employment in the fields of natural and physical sciences (especially physics and chemistry), mathematics and science education, medical and health sciences (including human biology, biomedical science, nanoscience and forensics), engineering including chemical, civil, electrical and mechanical engineering, avionics, communications and mining), computer science (including electronics and software design), psychology and business.