Mathematical Methods
General senior subject

General

Recommendation
A High Achievement (B) in Year 10 Mathematics or a Sound Achievement (C) in Year 10 Extension Mathematics.

Rationale
Mathematical Methods' major domains are Algebra, Functions, relations and their graphs, Calculus and Statistics. Mathematical Methods enables students to see the connections between mathematics and other areas of the curriculum and apply their mathematical skills to real-world problems, becoming critical thinkers, innovators and problem-solvers.

Students learn topics that are developed systematically, with increasing levels of sophistication, complexity and connection, and build on algebra, functions and their graphs, and probability from the P–10 Australian Curriculum. Calculus is essential for developing an understanding of the physical world. The domain Statistics is used to describe and analyse phenomena involving uncertainty and variation. Both are the basis for developing effective models of the world and solving complex and abstract mathematical problems.

Students develop the ability to translate written, numerical, algebraic, symbolic and graphical information from one representation to another. They make complex use of factual knowledge to successfully formulate, represent and solve mathematical problems.

Pathways
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.

Objectives
By the conclusion of the course of study, students will:
- select, recall and use facts, rules, definitions and procedures drawn from Algebra, Functions, relations and their graphs, Calculus and Statistics
- comprehend mathematical concepts and techniques drawn from Algebra, Functions, relations and their graphs, Calculus and Statistics
- communicate using mathematical, statistical and everyday language and conventions
- evaluate the reasonableness of solutions
- justify procedures and decisions by explaining mathematical reasoning
- solve problems by applying mathematical concepts and techniques drawn from Algebra, Functions, relations and their graphs, Calculus and Statistics.

Delivery (mode, time requirements, lessons)
Students are expected to undertake independent study to complete tasks and assessment in accordance with the Work Rate Calendar. Students also have access to a one-hour scheduled lesson and a one-hour tutorial each week. Course materials can be accessed in the learning management system.
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Student requirements
- Computer, access to email, scanner and internet, telephone and USB headset with microphone, exercise book and a protractor.
- Graphics Calculator (preferably Casio FXCG70AU or later)

Structure

Unit 1	Unit 2	Unit 3	Unit 4
Algebra, statistics and functions • Topic 1: Arithmetic and geometric sequences and series 1 • Topic 2: Functions and graphs • Topic 3: Counting and probability • Topic 4: Exponential functions 1 • Topic 5: Arithmetic and geometric sequences	**Calculus and further functions** • Topic 1: Exponential functions 2 • Topic 2: The logarithmic function 1 • Topic 3: Trigonometric functions 1 • Topic 4: Introduction to differential calculus • Topic 5: Further differentiation and applications 1 • Topic 6: Discrete random variables 1	**Further calculus** • Topic 1: The logarithmic function 2 • Topic 2: Further differentiation and applications 2 • Topic 3: Integrals	**Further functions and statistics** • Topic 1: Further differentiation and applications 3 • Topic 2: Trigonometric functions 2 • Topic 3: Discrete random variables 2 • Topic 4: Continuous random variables and the normal distribution • Topic 5: Interval estimates for proportions

Assessment

Formative assessment

Unit 1		Unit 2	
Problem Solving and Modelling Task		Examination	
Examination		Examination	
An average of C or higher for both pieces of assessment for QCE credit	1 credit	An average of C or higher for both pieces of assessment for QCE credit	1 credit

Summative assessment

Unit 3		Unit 4	
Summative internal assessment 1 (IA1): Problem-solving and modelling task	20%	Summative internal assessment 3 (IA3): Examination	15%
Summative internal assessment 2 (IA2): Examination	15%		
Summative external assessment (EA): 50% Examination			

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).

Disclaimer   All of the above information is accurate at the time of publication