

Course: **MATHEMATICS EXTENSION I**

3 Units for each of Preliminary and HSC Board Developed Course



Prerequisites: For students who intend to study the Mathematics Extension 1 course, it is recommended that they study the Stage 5.3 optional topics (identified by #) *Curve Sketching and Polynomials, Functions and Logarithms, and Circle Geometry of Mathematics Years 7-10 Syllabus*.

Course Description:

The content of the course, which includes the whole of the Mathematics (2 unit) course, and its depth of treatment indicate that it is intended for students who have demonstrated a mastery of the skills of Stage 5.3 mathematics and who are interested in the study of further skills and ideas in mathematics. The course is intended to give these students a thorough understanding of and competence in aspects of mathematics including many which are applicable to the real world. It has general educational merit and is also useful for concurrent studies of science, industrial arts and commerce. The course is a recommended minimum basis for further studies in mathematics as a major discipline at a tertiary level, and for the study of mathematics in support of the physical and engineering sciences. Although the Mathematics Extension 1 course is sufficient for these purposes, students of outstanding mathematical ability should consider undertaking the Mathematics Extension 2 course.

Main Topics Covered:

Preliminary Course:

Topics	Subtopics
Functions	ME-F1 Further Work with Functions ME-F2 Polynomials
Trigonometric Functions	ME-T1 Inverse Trigonometric Functions ME-T2 Further Trigonometric Identities
Calculus	ME-C1 Rates of Change
Combinatorics	ME-A1 Working with Combinatorics

HSC Course:

Topics	Subtopics
Proof	ME-P1 Proof by Mathematical Induction
Vectors	ME-V1 Introduction to Vectors
Trigonometric Functions	ME-T3 Trigonometric Equations
Calculus	ME-C2 Further Calculus Skills ME-C3 Applications of Calculus
Statistical Analysis	ME-S1 The Binomial Distribution

Summary of external and internal HSC assessment

Students undertaking the Mathematics Extension 1 course also complete all the assessments done in the Mathematics 2 unit course.

External examination	Mark
<i>Section I</i> Objective-response questions	10
<i>Section II</i> Short-answer questions	60
	70

Internal assessment	Weighting
Concepts, skills and techniques	50
Reasoning and communication	50
	100

Mathematics HSC examination specifications

The examination will consist of a written examination paper of two hours duration (plus five minutes reading time) containing two sections with a total mark value of 70 marks. All questions in the examination are compulsory.

Course: **MATHEMATICS EXTENSION II**

1 unit additional to the Extension 1 course, for the HSC Board Developed Course



Prerequisites:

Mathematics Extension 1. The syllabus is designed for students with a special interest in mathematics who have shown that they possess special aptitude for the subject.

Course Description:

The course offers a suitable preparation for study of mathematics at tertiary level, as well as a deeper and more extensive treatment of certain topics than is offered in other mathematics courses. It represents a distinctly high level in school mathematics involving the development of considerable manipulative skill and a high degree of understanding of the fundamental ideas of algebra and calculus. These topics are treated in some depth. This course provides a sufficient basis for a wide range of useful applications of mathematics as well as an adequate foundation for the further study of the subject.

Main Topics Covered:

The course content includes the entire 2 unit Mathematics course, the entire Mathematics Extension I course and, in addition, contains:

- Graphs
- Complex Numbers
- Conics
- Integration
- Volumes
- Mechanics
- Polynomials
- Harder 3 unit Topics

Summary of external and internal HSC assessment

Students undertaking the Mathematics Extension 2 course also complete all the assessments done in the Mathematics Extension 1 course.

External examination	Mark
<i>Section I</i> Objective-response questions	10
<i>Section II</i> Short-answer questions	90
	100

Internal assessment	Weighting
Concepts, skills and techniques	50
Reasoning and communication	50
	100

Mathematics HSC examination specifications

The examination will consist of a written examination paper of three hours duration (plus five minutes reading time) with a total mark value of 100 marks. All questions in the examination are compulsory.

The Mathematics Extension 2 examination paper will be based mainly on the Mathematics Extension 2 course and will focus on the course objectives and outcomes. The Mathematics Extension 1 course and the Mathematics course will be assumed knowledge for this examination. Questions focusing on Mathematics Extension 2 course outcomes may also relate to knowledge, skills and understanding from the Mathematics Extension 1 course and the Mathematics course.