# **Senior Mathematics**

HOD- Mr Moran

# **Senior Options**

Senior Secondary Mathematics Learning Area

# General

- results may contribute to an Australian Tertiary Admission Rank (ATAR) calculation
- results contribute to the Queensland Certificate of Education (QCE)
- · includes external assessment

General Mathematics

Mathematical Methods

Specialist Mathematics

# Applied

- no more than one Applied subject can contribute to an ATAR calculation
- results contribute to the QCE

**Essential Mathematics** 

Figure 2: Course structure

## **Essential Mathematics**

# Unit 1 Number, data and graphs

- Fundamental topic: Calculations
- . Topic 1: Number
- Topic 2: Representing data
- Topic 3: Graphs

#### Assessment

Formative internal assessment/s

# Unit 2 Money, travel and data

- Fundamental topic: Calculations
- Topic 1: Managing money
- Topic 2: Time and motion
- Topic 3: Data collection

### Assessment

Formative internal assessment/s

# Unit 3 Measurement, scales and data

- Fundamental topic: Calculations
- Topic 1: Measurement
- Topic 2: Scales, plans and models
- Topic 3: Summarising and comparing data

## Assessment

Summative internal assessment 1: Problem-solving and modelling task

Summative internal assessment 2: Common internal assessment

# Unit 4 Graphs, chance and loans

- Fundamental topic: Calculations
- Topic 1: Bivariate graphs
- Topic 2: Probability and relative frequencies
- Topic 3: Loans and compound interest

## Assessment

Summative internal assessment 3: Problem-solving and modelling task

Summative internal assessment 4: Examination

Students should have opportunities in Units 1 and 2 to experience and respond to the types of assessment they will encounter in Units 3 and 4.

For reporting purposes, schools should develop at least one assessment per unit, with a maximum of four assessments across Units 1 and 2.

# Learning Area Structure

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Essential Mathematics

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## **General Mathematics**

# Unit 1

# Money, measurement and relations

- Topic 1: Consumer arithmetic
- Topic 2: Shape and measurement
- Topic 3: Linear equations and their graphs

#### Assessment

Formative internal assessment/s

# Unit 2 Applied trigonometry, algebra, matrices and univariate data

- Topic 1: Applications of trigonometry
- Topic 2: Algebra and matrices
- Topic 3: Univariate data analysis

## Assessment

Formative internal assessment/s

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For reporting purposes, schools should develop at least one assessment per unit, with a maximum of four assessments across Units 1 and 2.

# Unit 3

# Bivariate data, sequences and change, and Earth geometry

- Topic 1: Bivariate data analysis
- Topic 2: Time series analysis
- Topic 3: Growth and decay in sequences
- Topic 4: Earth geometry and time zones

#### Assessment

Summative internal assessment 1:

Problem-solving and modelling task (20%)

Summative internal assessment 2:

Examination (15%)

# Unit 4 Investing and networking

- Topic 1: Loans, investments and annuities
- Topic 2: Graphs and networks
- Topic 3: Networks and decision mathematics

## Assessment

Summative internal assessment 3: Examination (15%)

Summative external assessment: Examination (50%)

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General Mathematics

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Essential Mathematics

Figure 2: Course structure

### Mathematical Methods

# Unit 1 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 and series 2

#### Assessment

Formative internal assessment/s

# Unit 2 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

## Assessment

Formative internal assessment/s

# Unit 3 Further calculus

- Topic 1: The logarithmic function 2
- Topic 2: Further differentiation and applications 2
- Topic 3: Integrals

# Assessment

Summative internal assessment 1: Problem-solving and modelling task (20%) Summative internal assessment 2: Examination (15%)

# Unit 4 Further functions and statistics

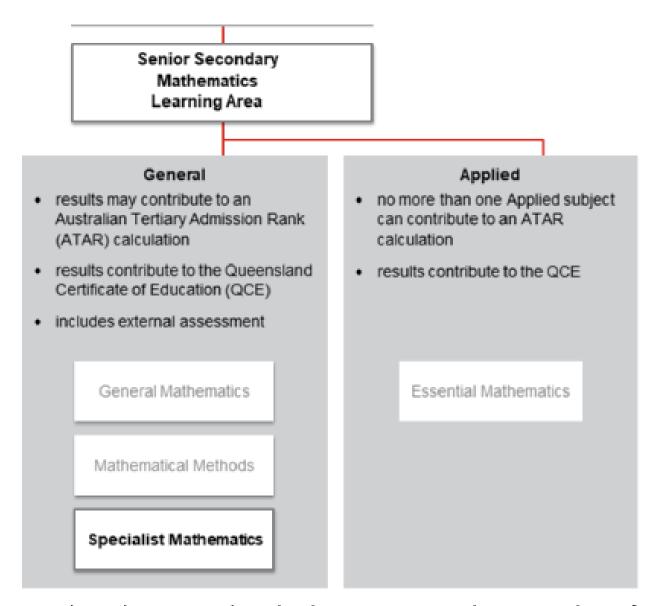
- Topic 1: Further differentiation and applications 3
- Topic 2: Trigonometric functions 2
- Topic 3: Discrete random variables 2
- Topic 4: Continuous random variables and the normal distribution
- Topic 5: Interval estimates for proportions

#### Assessment

Summative internal assessment 3: Examination (15%)

Students should have opportunities in Units 1 and 2 to experience and respond to the types of assessment they will encounter in Units 3 and 4.

For reporting purposes, schools should develop at least one assessment per unit, with a maximum of four assessments across Units 1 and 2. Summative external assessment: Examination (50%)



Specialist Mathematics is to be undertaken in conjunction with, or on completion of, Mathematical Methods.

Figure 2: Course structure

# Specialist Mathematics

# Unit 1 Combinatorics, vectors and proof

- Topic 1: Combinatorics
- Topic 2: Vectors in the plane
- Topic 3: Introduction to proof

## Assessment

Formative internal assessment/s

# Unit 2 Complex numbers, trigonometry, functions and matrices

- Topic 1: Complex numbers 1
- Topic 2: Trigonometry and functions
- Topic 3: Matrices

# Assessment

Formative internal assessment/s

# Unit 3 Mathematical induction, and further vectors, matrices and complex numbers

- Topic 1: Proof by mathematical induction
- Topic 2: Vectors and matrices
- Topic 3: Complex numbers 2

# Assessment

Summative internal assessment 1 Problem-solving and modelling task (20%) Summative internal assessment 2: Examination (15%)

# Unit 4 Further calculus and statistical inference

- Topic 1: Integration and applications of integration
- Topic 2: Rates of change and differential equations
- Topic 3: Statistical inference

## Assessment

Summative internal assessment 3: Examination (15%)

Students should have opportunities in Units 1 and 2 to experience and respond to the types of assessment they will encounter in Units 3 and 4.

For reporting purposes, schools should develop at least one assessment per unit, with a maximum of four assessments across Units 1 and 2. Summative external assessment: Examination (50%)

# **Essential Mathematics - Assessment**

- 2 x PSMT
- ▶ 1 Common Internal Assessment
- ▶ 1 Exam
- All equally weighted to produce and A to E ranking
- Can be used to contribute to an ATAR result but has a low contribution value
- If you are not passing General Mathematics it represents an appropriate choice

# **General- Mathematics**

- ► PSMT 20%, INTERNAL EXAMS 2 x 15% EXTERNAL EXAM 50%
- ▶ Only the results from Units 3 and 4 will contribute to ATAR calculations.
- You should already have a good idea on your pathway and be in the correct Year 10 pathway.
- Prerequisite: C or higher in Year 10 for General Maths, B or higher for Methods and Specialist Mathematics
- Strong in Mathematical Methods Prep (A or B) you can consider Specialist as a companion subject.

# ATAR and Scaling

- ATAR in its simplest form is a rank order of ATAR eligible students across the state based on a mark out of 500.
- Each subject has a maximum score of 100.
- ▶ The best 5 are added together to give you a mark out of 500

# Example 1

Subject	Raw Score	Scaled Score
English	76	84
General Mathematics	72	71
Physical Education	75	75
Biology	73	76
Modern History	69	74
Accounting	79	87
Total (out of a possible 500)		396

# **ATAR**

Scaled total	ATAR
500	99.95
498	99.90
495	98.85
<b>—</b>	<b>—</b>
396	76.35

# Inter subject scaling in Mathematics

Subject	Raw Subject Result	Scaled Result
Essential Mathematics	В	27
General Mathematics	72	71
Mathematical Methods	69	89
Specialist Mathematic	73	94