Mathematics
Courses

Mathematics Applications
(ATAR)

Students who have not met the minimum standard of numeracy through the Online Literacy and Numeracy Assessment (OLNA) are <u>not</u> eligible for this course

Pre-requisite: a 'B' grade or better in Year 10 Mathematics is highly recommended

Or a 'C' grade in Year 10A Mathematics is highly recommended

This course focuses on the use of mathematics to solve problems in contexts that involve financial modelling, geometric and trigonometric analysis, graphical and network analysis, and growth and decay in sequences.

It also provides opportunities for students to develop systematic strategies based on the statistical investigation process for answering statistical questions that involve analysing univariate and bivariate data, including time series data.

The Mathematics Applications ATAR course is designed for students who want to extend their mathematical skills beyond Year 10 level, but whose future studies or employment pathways do not require knowledge of calculus.

The course is designed for students who have a wide range of educational and employment aspirations, including continuing their studies at university or TAFE.

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Course Structure

Year 11

Unit 1

- Consumer arithmetic reviews the concepts of rate and percentage change in the context of earning and managing money and provides a fertile ground for the use of spread sheets.

- Algebra and matrices continues the Year 7–10 curriculum study of algebra and introduces the topic of matrices. The emphasis of this topic is the symbolic representation and manipulation of information from real-life contexts using algebra and matrices.

- Shape and measurement builds on and extends the knowledge and skills students developed in the Year 7–10 curriculum with the concept of similarity and associated calculations involving simple geometric shapes. The emphasis in this topic is on applying these skills in a range of practical contexts, including those involving three-dimensional shapes.

Unit 2

- Univariate data analysis and the statistical process develops students' ability to organise and summarise univariate data in the context of conducting a statistical investigation.

- Linear equations and their graphs uses linear equations and straight-line graphs, as well as linear-piece-wise and step graphs to model and analyse practical situations.

- Applications of trigonometry extends students' knowledge of trigonometry to solve practical problems involving non-right- angled triangles in both two and three dimensions, including problems involving the use of angles of elevation and depression and bearings in navigation.

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Year 12

Unit 3

- Bivariate data analysis introduces students to some methods for identifying, analysing and describing associations between pairs of variables, including the use of the least-squares method as a tool for modelling and analysing linear associations. The content is to be taught within the framework of the statistical investigation process.

- Growth and decay in sequences employs recursion to generate sequences that can be used to model and investigate patterns of growth and decay in discrete situations. These sequences find application in a wide range of practical situations, including modelling the growth of a compound interest investment, the growth of a bacterial population, or the decrease in the value of a car over time

- Graphs and networks introduces students to the language of graphs and the ways in which graphs, represented as a collection of points and interconnecting lines, can be used to model and analyse everyday situations, such as a rail or social network.

Unit 4

- Time series analysis continues students' study of statistics by introducing them to the concepts and techniques of time series analysis. The content is to be taught within the framework of the statistical investigation process.

- Loans investments and annuities aims to provide students with sufficient knowledge of financial mathematics to solve practical problems associated with taking out or refinancing a mortgage and making investments.

- Networks and decision mathematics uses networks to model and aid decision making in practical situations.