Mathematics Courses

The following contains a description of the course we offer to students at St Marys Senior High. It is intended as a guide to help you select your subjects and you should read it carefully.

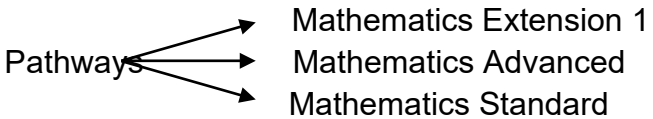
Please note:

- The details given represent the way that the course is delivered at St Marys Senior High and may involve different choices from the way other schools might operate the same course.
- Classes can only be formed where sufficient students select the particular course. The fact that a course is listed here is not a commitment to run the course in a particular year.
- The arrangements for particular courses are subject to change for a variety of reasons.
- HSC students may elect to take extension courses which we offer in English, French, History, Japanese, Mathematics and Music.

Mathematics Courses

It is important that students choose the correct Mathematics course from the start of Year 11. This is to avoid the problems of missing work and tests. The deadline for changing Preliminary Mathematics courses at St Marys Senior High School is the end of Term 1.

The diagrams below are an attempt to suggest the kind of Stage 5 background a student needs for successful study in a given senior course. However, each student will need to carefully assess their own position and be honest about such matters as study and work commitment.



Core → Mathematics Standard

Note: For students who have studied Mathematics to the Core level only, the following option topics are a prerequisite for Mathematics Standard:

- *Trigonometry*
- *Further Algebra*

Mathematics Standard - Course Details			
Units	**Type**	**ATAR**	**Faculty Teaching This Course**
2	Board Developed Course – Examinable at the HSC, marks can be used to count towards an ATAR	A – Counts towards an ATAR with no restrictions	Mathematics

What will I be doing in this course?

Note: The Preliminary Mathematics Standard course is undertaken by all students intending to study either the HSC Mathematics Standard 2 course or the HSC Mathematics Standard 1 course.

The Mathematics Department will NOT be offering the HSC Mathematics Standard 1 course for study in Year 12.

Mathematics Standard focuses on mathematical skills and techniques which have direct application to everyday activity. The course content is written in four areas of study in Year 11; Financial Mathematics, Statistical Analysis, Measurement, Probability and Algebra and the same focus areas in Year 12 including Networks. Note: Calculus is NOT covered in this course.

What should I be able to do at the end of this course?

Students should:

- develop the ability to apply reasoning, and the use of appropriate language, in the evaluation and construction of arguments and the interpretation and use of models based on mathematical concepts
- develop the ability to use concepts and apply techniques to the solution of problems in algebra and modelling, measurement, financial mathematics, data and statistics, probability and networks
- develop the ability to use mathematical skills and techniques, aided by appropriate technology, to organise information and interpret practical situations
- develop the ability to interpret and communicate mathematics in a variety of written and verbal forms, including diagrams and graphs.

How will I be assessed in this course?

The Year 11 formal school-based assessment program will consist of three assessment tasks.
The Year 12 formal school-based assessment program may consist of up to four assessment tasks.

How will this course help me in the future?

Mathematics Standard is fully prescribed and is designed to support TAFE and other vocational courses. It provides an appropriate mathematical background for students who wish to undertake university study in the areas of business, humanities, nursing and paramedical science. However, this course does NOT prepare students for further studies in mathematics beyond the HSC. Students should check prerequisites for specific tertiary courses.

Mathematics Advanced - Course Details			
Units	**Type**	**ATAR**	**Faculty Teaching This Course**
2	Board Developed Course – Examinable at the HSC, marks can be used to count towards an ATAR	A – Counts towards an ATAR with no restrictions	Mathematics

What will I be doing in this course?

The study of Mathematics Advanced in Stage 6:

- Is focused on enabling students to appreciate that mathematics is a unique and powerful way of viewing the world to investigate order, relation, pattern, uncertainty and generality.
- provides students with the opportunity to develop ways of thinking in which problems are explored through observation, reflection and reasoning.

The course content is written in five areas of study in Year 11 : Functions, Trigonometry, Calculus, Exponentials and Logarithms, and Statistical Analysis and the same focus areas in Year 12 including Financial Mathematics.

What should I be able to do at the end of the course?

Students should:

- develop knowledge, understanding and skills about efficient strategies for pattern recognition, generalisation and modelling techniques
- develop the ability to use mathematical concepts and skills and apply complex techniques to the modelling and solution of problems in algebra and functions, measurement, financial mathematics, calculus, data, statistics and probability
- develop the ability to use advanced mathematical models and techniques, aided by appropriate technology, to organise information, investigate, model and solve problems and interpret a variety of practical situations

- develop the ability to interpret and communicate mathematics logically and concisely in a variety of forms.

How will I be assessed in this course?

The Year 11 formal school-based assessment program will consist of three assessment tasks.
The Year 12 formal school-based assessment program may consist of up to four assessment tasks.

How will this course help me in the future?

This course prepares students to matriculate for tertiary institutions. The Mathematics Advanced course provides the minimum basis for entry into tertiary courses requiring mathematics. Students intending to do tertiary studies should check prerequisites for specific courses. Students that have acquired a very high level of competence in the 5.3 course in Years 9 and 10 and who require substantial mathematics at a tertiary level supporting the physical sciences, computer science or engineering should undertake the Mathematics Extension 1 or Extension 2 courses.

Mathematics Extension 1 - Course Details			
Units	**Type**	**ATAR**	**Faculty Teaching This Course**
1	Board Developed Course – Examinable at the HSC, marks can be used to count towards an ATAR	A – Counts towards an ATAR with no restrictions	Mathematics

What will I be doing in this course?

This 1 unit Extension course is undertaken while studying the Mathematics Advanced course in both the Preliminary and HSC years (Years 11 and 12). The content of this course, which includes the entire Mathematics Advanced course, and its depth of treatment indicate that it is intended only for students who have acquired a ***very high level*** of competence in the ***Year 10 Mathematics Pathways course***. The course is intended to give these students a thorough understanding of and competence in aspects of mathematics including many of which are applicable to the real world. This course is useful for concurrent studies of science, engineering science and economics.

The course content is written in four areas of study in Year 11 : Functions, Trigonometric Functions, Calculus, and Combinatorics and in the Year 12 : Proof, Vectors, Trigonometric Functions, Calculus and Statistical Analysis.

For the Year 12 course:

- The Mathematics Advanced Year 12 course should be taught prior to or concurrently with this course.
- The Mathematics Advanced Year 11 course is a prerequisite.
- Students should experience content in the course in familiar and routine situations as well as unfamiliar situations.

Students should be provided with regular opportunities involving the integration of technology.

What should I be able to do at the end of the course?

Students should:

- Have confidence in their ability to do mathematics and enjoy seeing mathematics in the world around them.
- Approach mathematics problems with a confident and positive attitude.
- Develop an awareness of the usefulness of mathematics in the community and appreciate the contribution of mathematics to our society.

How will I be assessed in this course?

The Year 11 formal school-based assessment program will consist of three assessment tasks, one of which will be an assignment or investigation style assessment.
The Year 12 formal school-based assessment program may consist of up to four assessment tasks, one of which will be an assignment or investigation-style assessment.

How will this course help me in the future?

Mathematics Extension 1 is focused on enabling students to develop a thorough understanding of and competence in further aspects of mathematics. The course provides opportunities to develop rigorous mathematical arguments and proofs, and to use mathematical models more extensively. Students of Mathematics Extension 1 will be able to develop an appreciation of the interconnected nature of mathematics, its beauty and its functionality.

Mathematics Extension 1 provides a basis for progression to further study in mathematics or related disciplines in which mathematics has a vital role at a tertiary level. An understanding and exploration of Mathematics Extension 1 is also advantageous for further studies in such areas as science, engineering, finance and economics.

Mathematics Extension 2 - Course Details			
Units	**Type**	**ATAR**	**Faculty Teaching This Course**
1	Board Developed Course – Examinable at the HSC, marks can be used to count towards an ATAR	A – Counts towards an	Mathematics

		ATAR with no restrictions	

What will I be doing in this course?

This course is a 1 unit extension course which is undertaken while studying the Mathematics Extension 1 HSC course (that is, this is a **Year 12 extension course**). The Extension 2 course includes the entire Mathematics (2 unit) course, the entire Extension 1 course as well as several other major topics. ***This course is very demanding and is intended only for outstanding Preliminary Extension 1 students***. It represents a distinctly high level of mathematics involving the development of considerable manipulative skills and a high degree of understanding of the fundamental ideas of algebra and calculus.

The course content is written in five areas of study in Year 12 : Proof, Vectors, Complex Numbers, Calculus and Mechanics.

What should I be able to do at the end of this course?

Students should:

- develop efficient strategies to solve complex problems using pattern recognition, generalisation, proof and modelling techniques
- develop their knowledge, skills and understanding to model and solve complex and interconnected problems in the areas of proof, vectors and mechanics, calculus and complex numbers
- develop their problem-solving and reasoning skills to create appropriate mathematical models in a variety of forms and apply these to difficult unstructured problems
- use mathematics as an effective means of communication and justification in complex situations.

How will I be assessed in this course?

The Year 12 formal school-based assessment program may consist of up to four assessment tasks, one of which will be an assignment or investigation-style assessment.

How will this course help me in the future?

This course offers a very sound preparation for the student who wishes to engage in tertiary study in mathematics/science/engineering based courses.