Mathematical Association of New South Wales Inc
MANSW - Promoting Quality Mathematics Education for All

STUDYING MATHEMATICS FOR THE HSC AND BEYOND

Information for Students and Parents

The Mathematical Association of NSW (MANSW) is a not-for-profit professional body for mathematics educators of students of all ages. MANSW has compiled the following information to assist students in choosing an appropriate level of HSC (Higher School Certificate) mathematics course for Years 11 and 12.

Mathematics forms an important part of a well-rounded education. Although not compulsory in Years 11 and 12, the study of mathematics builds logical, problem-solving capacity and analytical thinking skills, applicable in many varied situations and careers.

MANSW believes that all students can improve their understanding of mathematics through engagement in an appropriate level of course at Stage 6, commensurate with their current capabilities.

Students are advised to choose a mathematics course that is appropriate to their interests and current achievement level, but which also challenges them to gain a deeper understanding and hence to improve their level of mastery.

Mathematics Advanced, Mathematics Extension 1 and Mathematics Extension 2 are incrementally challenging 'calculus courses' involving a high level of algebraic manipulation, respectively building on knowledge and skills developed by previous levels. Content of courses is specific, but interwoven with underlying mathematical concepts and skills, common to all three courses. Studying a higher level of mathematics can enhance mastery of a lower level. If students are unsure whether or not they will succeed with a particular level of mathematics, **they are advised to start in the higher level course**; even if they do not complete this, they may well benefit from the experience and achieve a better result in the lower level course.

From 2019, the NSW HSC Mathematics course options are:

Year 11	**Year 12**
No mathematics	No mathematics
Mathematics Standard	Mathematics Standard 1 or Mathematics Standard 2
Mathematics Advanced	Mathematics Advanced
Mathematics Advanced and Mathematics Extension 1	Mathematics Advanced and Mathematics Extension 1
Mathematics Advanced and Mathematics Extension 1	Mathematics Advanced and Mathematics Extension 1 and Mathematics Extension 2

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Students intending to go to university to study any kind of STEM degree (Science, Technology, Engineering, Mathematics) should choose Mathematics Advanced and are strongly advised to include Mathematics Extension 1 in Years 11 and 12 and if possible Mathematics Extension 2 in Year 12. Students aiming to study STEM degrees and degrees which include STEM subjects (such as economics, psychology and commerce), are advised to choose the highest level of mathematics in Years 11 and 12 of which they might be capable.

Mathematics Standard is aimed at students who wish to continue with their study of mathematics in Years 11 and 12 to gain a better understanding and application of mathematics and numeracy in real-world situations. It is suitable for a wide range of future career options, including many different trades, requiring financial, statistical and practical problem-solving capabilities. Studying Mathematics Standard in Years 11 and 12 will be more beneficial in helping you to develop practical analytical skills than not studying mathematics in your senior years of school.

Mathematics Standard will not prepare you for a Science, Medicine, Engineering or Mathematics degree. The University of Sydney has introduced prerequisites from 2019. Students will need to score at least a Band 4 in Mathematics Advanced (or an E3 in Mathematics Extension 1) in order to enter first year subjects in a wide range of economics, commerce, science and engineering degrees.

Some universities offer mathematics bridging courses or Foundation Mathematics for students who have not studied a sufficient level of mathematics at school. These courses are typically completed in the first year of university. However, this pathway is not advisable due to the high rates of attrition as well as considerable extra fees and time incurred by students; it is far better for students to have studied an appropriately rigorous level of mathematics in Years 11 and 12. Research shows that students who complete Mathematics Advanced, Mathematics Extension 1 and/or Mathematics Extension 2 in Years 11 and 12 are far better equipped to deal with university courses with mathematical requirements.

Common content introduced to the new HSC courses means that performance in Mathematics Standard will be able to be directly compared with Mathematics Advanced, so any previous advice relating to ATAR scaling of HSC examinations is no longer likely to be applicable in choosing 2019 courses.

Students should consult their teachers, parents and /or careers advisors before choosing options for Years 11 and 12. However, sound advice generally involves choosing on the basis of what students enjoy studying, rather than what they 'ought to study'; for instance, just because Mathematics Extension 2 is 'not necessary' to gain access to an Engineering course does not mean it is 'not advisable'. Furthermore, if students do not enjoy mathematics, they will probably not enjoy STEM courses at university.

Students are also advised to refer to the University Admission Centre (UAC) guide to ascertain the 'assumed knowledge' and 'recommended studies' for the university courses they are considering.

MANSW is often asked about whether it is advisable to study Mathematics Standard or Mathematics Advanced for HSC. Our advice is summarised in the following two tables:

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"Should I do Mathematics Advanced or Mathematics Standard in Years 11 and 12?"

The case for Mathematics Standard

Prior learning and background knowledge, skills and understanding	
If there are things you did in Years 7 to 10 that were confusing at the time you will have a chance to consolidate your learning.	BUT… You will revise many things that you may already know.
Mathematical content of the course	
The syllabus includes Applications and Modelling and other topics in which the mathematics is presented in real-life contexts. You will study Statistics, which is something you might need when you get to university. The syllabus includes the compulsory use of spreadsheets and other technology.	BUT… The content of Mathematics Standard will not prepare you for many of the STEM* degrees at university. Statistics is covered in greater depth in the Mathematics Advanced course.
Time and effort required	
Capable students may find that they do not need to invest a huge amount of time into homework and studying.	BUT… There are still many different topics and concepts to be covered and attaining a high level of achievement will still involve considerable practice. If you are not challenged by the level of mathematics, you may become disengaged.
Your fellow students	
You will not be in the same cohort as those students from other mathematics courses or students who have accelerated their study of mathematics.	BUT… This course is designed for students who require more time to consolidate Mathematics 7 to 10. There is now common content with Mathematics Advanced, so your level of mathematics can be compared with those studying Mathematics Advanced when calculating your ATAR.
HSC Examination	
You will be given a Reference Sheet which will reduce the need to memorise certain formulae.	BUT… The literacy demands are very high. Some of your responses will be written in mathematical text including diagrams but you also need to be able to explain your thinking and justify answers.
Entering university and succeeding in a STEM* degree	
Some university degrees do not have mathematical requirements of any sort. See note on page 2 about Sydney University's prerequisites.	BUT… If you choose a STEM degree you may be required to do a bridging course before you start first year or do a year of Foundation Studies.

* Science-Technology-Engineering-Mathematics

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"Should I do Mathematics Advanced or Mathematics Standard in Years 11 and 12?"

The case for Mathematics Advanced

Prior learning and background knowledge, skills and understanding	
Students who have completed mathematics from 5.2 and 5.3 in Years 9 and 10 will have adequate background knowledge for Mathematics Advanced.	BUT… If you did not do 5.3 Mathematics in Years 9 and 10 you will need to learn several new concepts, prior to the start of Year 11.
Mathematical content of the course	
There will be some revision of prior learning, but most of the content will be new to you. You will learn calculus, which prepares students more effectively for success in university STEM* courses such as Engineering and Physics.	BUT… You will need to develop a fluency with algebraic manipulation to succeed with Mathematics Advanced.
Time and effort required	
With a consistently diligent approach throughout Years 11 and 12, many students become familiar with the topics and techniques required and become capable of achieving a good performance in the HSC.	BUT… You might feel that your teacher moves quickly through topics. Some students may need to spend more time on mathematics than their other subjects.
HSC Examination	
You will be given a Reference Sheet which will reduce the need to memorise certain formulae. Most of your responses will be written in mathematical text and graphs but you also need to be able to explain your thinking and justify your answers.	BUT… The HSC Examination builds upon all knowledge and skills developed throughout Stages 5 and 6 mathematics.
Entering university and succeeding in a STEM* degree	
You have a much greater chance of succeeding if you complete Mathematics Advanced than if you do no mathematics or Mathematics Standard. See note on page 2 about Sydney University's prerequisites.	BUT… If you also do Mathematics Extension 1 (and possibly Mathematics Extension 2) you may be better prepared for your university course.

* Science-Technology-Engineering-Mathematics

The information presented in this document reflects the considered views of the Mathematical Association of NSW (MANSW) and is based on available evidence and research findings. MANSW accepts no responsibility for the choices made by students based on the information provided in this document. Readers should investigate all information around this subject before choosing a mathematics course for Years 11 and 12.

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