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The key features of the draft senior secondary Australian Curriculum for mathematics

The draft senior secondary mathematics curriculum consists of four courses:

1. Essential Mathematics (Course A)
2. General Mathematics (Course B)
3. Mathematical Methods (Course C)
4. Specialist Mathematics (Course D)

The courses are differentiated, with each course focussed on a pathway that will meet the needs of a particular group of senior secondary students in their further learning or tertiary studies.

Each of the four courses in the draft senior secondary Australian Curriculum for Mathematics for senior secondary years is further organised into four units that will typically be completed over four semesters. Each of the four units contains up to four topics, which build on the knowledge and understanding encountered in the year K-10 syllabus.

The *Shape of the Australian Curriculum – Mathematics* describes three content strands: number and algebra; statistics and probability; and measurement and geometry. In the senior secondary years these strands have been continued but are no longer used as major organisers. This is because the ideas in each of the strands both converge and diverge.

The proficiency strands of understanding, fluency, reasoning and problem solving have been integrated into the content descriptions, as in the K-10 curriculum.

The draft senior secondary Australian Curriculum for mathematics builds on the K-10 curriculum by offering courses to cater for the needs and requirements of every student wishing to undertake further study of mathematics in the senior years.

The purpose and nature of each senior secondary mathematics course and the links to K-10 Australian Curriculum

The four courses within the draft senior secondary Australian Curriculum for mathematics are:

Essential mathematics –

focuses on using mathematics to make sense of the world. The emphasis is on providing students with the mathematical skills and understanding to solve problems and undertake investigations in a range of workplace, personal, training and community settings. There is an emphasis on the use and application of information and communication technologies in the course. The course includes investigation of the application of mathematical understanding and skills in workplaces or community settings.

Essential mathematics has been designed as a stand-alone subject. However, there has been consideration given to students who may wish to pick up the course at unit 3, having previously not studied mathematics in the senior years or studied units 1 and 2 of General mathematics.

General mathematics –

is designed to equip students with the confidence, understanding, skills and strategies to apply mathematical techniques to the analysis and solution of problems. The course provides an introduction to some areas of discrete mathematics, including non-calculus methods of optimisation. Statistics and financial mathematics and their applications are important parts of this course.

General mathematics is designed for students who wish to undertake further studies in areas such as agricultural, health and social sciences, business and education where mathematical knowledge facilitates problem solving and decision making. General mathematics has been designed as a stand-alone course or studied in conjunction with Mathematical methods. Students may choose to move from General mathematics to Essential mathematics at the end of Unit 1 or 2.

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Mathematical methods –

is designed for students with an interest in mathematics and whose future pathways may involve mathematics at university. The focus is on function, calculus and statistics and the course provides a strong foundation for further studies in disciplines in which mathematics has an important role, including economics, political and social sciences and all branches of physical and biological sciences. Mathematical methods has been designed as a stand-alone course, or to be taken in conjunction with General mathematics or with Specialist mathematics.

Specialist mathematics –

is designed for students with a strong interest in mathematics including those intending to study mathematics, physical sciences or engineering at university. The course is intended to be taken in conjunction with Mathematical methods. The course contains topics in functions and calculus that build on and deepen the ideas presented in Mathematical methods. Vectors, complex numbers and recursive methods are introduced. The emphasis is on the application of mathematics.

Specialist mathematics is designed to be taken in conjunction with Mathematical methods. There has been consideration given to students who have studied units 1 and 2 in Mathematical Methods to enter Specialist Mathematics at unit 3.

How are the general capabilities and cross-curriculum dimensions addressed within the draft senior secondary Australian Curriculum for mathematics?

Good teaching in each of the subjects will always contribute to students' development of general capabilities and understanding of the cross-curriculum dimensions. The Australian Curriculum reinforces this expectation by incorporating the general capabilities and cross-curriculum dimensions into the content descriptions in ways appropriate to each subject. For example, mathematics provides a framework for thinking and a means of communication that is powerful, logical, concise and precise.

In writing the Australian Curriculum, considerable attention has been paid to the development of literacy and numeracy as the foundations on which much further learning depends. Information and Communication Technologies (ICT) has been incorporated into all topic areas. Thinking skills and the scope for creativity is inherent in all mathematical problem solving and so is an integral part of the draft senior secondary mathematics curriculum.

Other general capabilities of self management, teamwork, intercultural understanding, ethical behaviour and social competence, as well as the three cross-curriculum dimensions, are able to be addressed in a classroom environment where the content can be delivered within a context suitable for a particular student group.

The draft senior secondary Australian Curriculum for mathematics provides opportunities for the study of mathematics within a relevant context, giving students the means to explore, evaluate and comment on information presented to them.

What national comparisons and/or international references have been identified in developing the draft senior secondary Australian Curriculum for Mathematics?

The proposed courses of the draft senior secondary mathematics curriculum provide a level of challenge similar to the existing state and territory curricula they will ultimately replace. Comparisons of the draft senior secondary Australian Curriculum for mathematics with mathematics curricula of the states and territories have been undertaken as part of ACARA's curriculum mapping exercise and outcomes will further inform the development of the national mathematics curriculum.

The draft senior secondary mathematics curriculum includes a greater emphasis on statistics and probability. These are major components of new courses developed in Singapore and Hong Kong curricula, which are two countries with which Australia's performance is often compared.