The new Mathematics Advanced syllabus has been developed using the established NSW Education Standards Authority (NESA) syllabus development process. The syllabus includes Australian curriculum content and reflects the new directions of the Stronger HSC Standards reforms.

The Stronger HSC Standards reforms include:
• supporting the achievement of high minimum standards for all students
• ensuring the flexibility and versatility of the Higher School Certificate (HSC) to cater for the full range of students
• encouraging every student to achieve at their highest possible level
• a focus on the acquisition of deep knowledge, understanding and skills for students.

NSW Stage 6 syllabuses are inclusive of the learning needs of all students. The syllabuses accommodate teaching approaches that support student diversity, including students with special education needs, gifted and talented students and students learning English as an additional language or dialect (EAL/D).

Many of the features of the current Stage 6 syllabuses have been retained, including:
• rationale
• aim
• objectives
• outcomes
• content for Year 11 and Year 12 courses.

New features of Stage 6 syllabuses include:
• Australian curriculum content identified by codes
• Learning across the curriculum content, including cross-curriculum priorities and general capabilities
• publication in an interactive online format
• an interactive glossary.
What is similar?

Students will continue to be provided with opportunities to:
• develop Working Mathematically skills in an integrated way
• study topics such as Functions, Trigonometric Functions and Calculus
• learn about mathematical ideas and concepts including variables, functions and rates of change, and their application to real-world situations
• construct, use and interpret models based on mathematical concepts
• develop skills in constructing proofs and proving results
• use precise language and notation.

What is different?

• The syllabus name has changed from Mathematics to Mathematics Advanced.
• Content is organised in topic and subtopics.
• Content builds on elements of Stage 5 which are identified in a section at the start of the syllabus.
• Opportunities for Applications and Modelling are identified.
• The use of digital technologies to organise, interpret, model and solve problems has been strengthened.
• Working Mathematically is embedded and comprises six components: Understanding, Fluency, Communicating, Problem Solving, Reasoning and Justification.
• New content includes:
  - Statistical Analysis
  - Financial Mathematics
  - some amendments in notation and language conventions.

Why is assessment changing?

The Stronger HSC Standards reforms provide new directions for assessment practices in all Stage 6 courses to:
• rebalance the emphasis on assessment to allow more time for teaching and learning
• maintain rigorous standards
• provide opportunities to assess students’ depth of knowledge and their conceptual, analytical and problem-solving skills.

School-based assessment requirements for Mathematics Advanced have changed to reflect new outcomes, course structure and content.
How are the school-based assessment requirements for Mathematics Advanced changing?

NESAs continues to promote a standards-referenced approach to assessing and reporting student achievement. The approaches of assessment for, assessment as and assessment of learning are important to guide future teaching and learning opportunities and to provide students with ongoing feedback.

Changes to school-based assessment requirements for each course include:
• mandated components and weightings for Year 11 and Year 12
• capping the number of school-based assessment tasks to three in Year 11 and four in Year 12
• specified minimum and maximum weightings for formal tasks
• a variety of tasks to assess student knowledge, understanding and skills.

What is the plan for implementation?

<table>
<thead>
<tr>
<th>2018</th>
<th>2019</th>
<th>2020</th>
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</thead>
<tbody>
<tr>
<td>Familiarisation and planning</td>
<td>Start teaching new Year 11 courses for Mathematics Advanced and Mathematics Extension</td>
<td>First HSC examinations for new Mathematics Advanced, Mathematics Extension 1 and Mathematics Extension 2 courses</td>
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<tr>
<td></td>
<td>Start implementing new Year 11 school-based assessment requirements for Mathematics Advanced and Mathematics Extension</td>
<td></td>
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<tr>
<td></td>
<td>Start teaching new Year 12 courses for Mathematics Advanced, Mathematics Extension 1 and Mathematics Extension 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start implementing new Year 12 school-based assessment requirements for Mathematics Advanced, Mathematics Extension 1 and Mathematics Extension 2</td>
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</table>
What materials will be provided to support implementation?

Many existing resources will continue to be useful and relevant. Teaching units will need modification to meet the requirements of the new syllabus.

Support materials will assist teachers in familiarisation and planning for implementation of the syllabus and assessment requirements. Program Builder, an online programming tool, will be available for teachers from Term 1, 2018.

**Initial materials** released with the syllabus include:
- school-based assessment requirements
- assessment advice
- a parent guide to new syllabuses and assessment.

**Additional materials** to be released throughout Term 4, 2017 and Terms 1 and 2, 2018 include:
- sample scope and sequences
- sample teaching units
- sample assessment schedules
- sample assessment tasks
- advice on making adjustments for students with special education needs.

**HSC Examination Specifications** with sample materials will be released in 2018.

The NSW Department of Education, the Catholic Education Commission NSW, the Association of Independent Schools of NSW and other school systems and professional teacher associations will continue to assist and support implementation of the syllabus.

How can I access the new Mathematics Advanced syllabus?

The Mathematics Advanced syllabus is available on the NESA website.
Features of Mathematics Advanced content pages

**Statistical Analysis**

**MA-S1 Probability and Discrete Probability Distributions**

**Outcomes**

A student:
- uses concepts and techniques from probability to present and interpret data and solve problems in a variety of contexts, including the use of probability distributions MA11.7
- uses appropriate technology to investigate, organise, model and interpret information in a range of contexts MA11.8
- provides reasoning to support conclusions which are appropriate to the context MA11.9

**Subtopic Focus**

The principal focus of this subtopic is to introduce the concepts of conditional probability and independence and develop an understanding of discrete random variables and their uses in modelling random processes involving chance.

Students develop their skills related to probability, its language and visual representations, and use these skills to solve practical problems. They develop an understanding of probability distributions and associated statistical analysis methods and their use in modelling binomial events. These concepts play an important role in later studies of statistics, particularly in beginning to understand the concept of statistical significance.

Within this subtopic, schools have the opportunity to identify areas of Stage 5 content which may need to be reviewed to meet the needs of students.

**Content**

**S1.1: Probability and Venn diagrams**

Students:
- understand and use the concepts and language associated with theoretical probability, relative frequency and the probability scale
- solve problems involving simulations or trials of experiments in a variety of contexts AAM
  - identify factors that could complicate the simulation of real-world events (ACMM1S3)
  - use relative frequencies obtained from data as point estimates of probabilities (ACMM055)
- use arrays and tree diagrams to determine the outcomes and probabilities for multi-stage experiments (ACMEM150) AAM
- use Venn diagrams, set language and notation for events, including \( A \) (or \( A' \) or \( A'' \)) for the complement of an event \( A \), \( A \cap B \) for \( A \) and \( B \), the intersection of events \( A \) and \( B \), and \( A \cup B \) for \( A \) or \( B \), the union of events \( A \) and \( B \), and recognise mutually exclusive events (ACMM050) AAM
  - use everyday occurrences to illustrate set descriptions and representations of events and set operations (ACMM051)
- use the rules \( P(\overline{A}) = 1 - P(A) \) and \( P(A \cup B) = P(A) + P(B) - P(A \cap B) \) (ACMM054) AAM
- understand the notion of conditional probability and recognise and use language that indicates conditional probability (ACMM056)

Content is organised by topic and subtopic.

The subtopic focus describes the scope of learning.

Content defines what students are expected to know and do.

Key terms are linked to the glossary.

Opportunities for Applications and Modelling (AAM) are identified.

Content is organised in Years.

Content common to the Mathematics Standard course is identified.

Outcomes are coded and linked to content.

Learning across the curriculum content is identified by icons.

Australian curriculum content is identified by codes.