 Mathematics Advanced – scope and sequence

All outcomes referred to in this unit come from the [Mathematics Advanced](http://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/stage-6-mathematics/mathematics-advanced-2017) syllabus  
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| Term 1 | Weeks 1-2 | Weeks 3-4 | Weeks 5-6 | Weeks 7-9 | Weeks 9-10 |
| --- | --- | --- | --- | --- | --- |
| Unit | MA-F1.1  Algebraic techniques | MA-F1.2  Introduction to functions | MA-F1.3  Linear, quadratic and cubic functions | MA-F1.4  Further functions and relations | MA-C1  Introduction to differentiation |
| Outcomes | MA11-1, MA11-2, MA11-8, MA11-9 | MA11-1, MA11-2, MA11-8, MA11-9 | MA11-1, MA11-2, MA11-8, MA11-9 | MA11-1, MA11-2, MA11-8, MA11-9 | MA11-1, MA11-5, MA11-8, MA11-9 |
| Assessment |  |  |  | Topic test |  |

| Term 2 | Weeks 1-2 | Weeks 3-7 | Weeks 7-10 |
| --- | --- | --- | --- |
| Unit | MA-C1  Introduction to differentiation | MA-T1  Trigonometry and measure of angles | MA-T2  Trigonometric functions and identities |
| Outcomes | MA11-1, MA11-5, MA11-8, MA11-9 | MA11-1, MA11-3, MA11-8, MA11-9 | MA11-1, MA11-4, MA11-8, MA11-9 |
| Assessment |  | Assignment – how are outdoor concert spaces designed? |  |

| Term 3 | Weeks 1-3 | Weeks 4-5 | Weeks 6-8 | Weeks 9-10 |
| --- | --- | --- | --- | --- |
| Unit | MA-S1.1  Probability and Venn diagrams | MA-S1.2  Discrete probability distributions | MA-E1  Logarithms and exponentials | Examination period |
| Outcomes | MA11-7, MA11-8, MA11-9 | MA11-7, MA11-8, MA11-9 | MA11-6, MA11-8, MA11-9 |  |
| Assessment |  |  |  | Yearly examination |

| Term 4 | Weeks 1-2 | Weeks 3-4 | Weeks 5-6 | Weeks 7-8 | Weeks 9-10 |
| --- | --- | --- | --- | --- | --- |
| Unit | MA-E1  Logarithms and exponentials | MA-F2  Graphing techniques | MA-C2.1  Differentiation of trigonometry, exponential and logarithmic functions | MA-C2.2  Rules of differentiation | MA-C4.1  The anti-derivative |
| Outcomes | MA11-6, MA11-8, MA11-9 | MA12-1, MA12-9, MA12-10 | MA12-3, MA12-6, MA12-9, MA12-10 | MA12-3, MA12-6, MA12-9, MA12-10 | MA12-3, MA12-7, MA12-9, MA12-10 |
| Assessment |  |  |  |  | **Topic test** |

| Term 1 | Weeks 1-2 | Weeks 3-4 | Weeks 5-6 | Weeks 7-9 | Week 10 |
| --- | --- | --- | --- | --- | --- |
| Unit | MA-C3.1  The first and second derivatives | MA-C3.2  Applications of the derivative | MA-C4.2  Areas and the definite integrals | MA-T3  Trigonometric functions and graphs |  |
| Outcomes | MA12-3, MA12-6, MA12-9, MA12-10 | MA12-3, MA12-6, MA12-9, MA12-10 | MA12-3, MA12-7, MA12-9, MA12-10 | MA12-1, MA12-5, MA12-9, MA12-10 |  |
| Assessment |  |  |  | **Assignment** - can mathematics predict periodic phenomena? |  |

| Term 2 | Weeks 1-2 | Weeks 3-4 | Weeks 5-6 | Weeks 7-9 | Week 10 |
| --- | --- | --- | --- | --- | --- |
| Unit | MA-S2.1  Data (grouped and ungrouped) and summary statistics | MA-S2.2 Bivariate data analysis | MA-C3.1  Continuous random variables | MA-C3.2  The normal distribution |  |
| Outcomes |  | MA12-8, MA12-9, MA12-10 | MA12-8, MA12-9, MA12-10 | MA12-8, MA12-9, MA12-10 |  |
| Assessment |  |  |  | **Topic test** |  |

| Term 3 | Week 1 | Weeks 2-3 | Weeks 4-5 | Weeks 6-7 | Weeks 8-10 |
| --- | --- | --- | --- | --- | --- |
| Unit | MA-M1.1  Modelling investments and loans | MA-M1.2  Arithmetic sequences and series | MA-M1.3  Geometric sequences and series | MA-M1.4  Financial applications of sequences and series |  |
| Outcomes | MA12-2, MA12-4, MA12-9, MA12-10 | MA12-2, MA12-4, MA12-9, MA12-10 | MA12-2, MA12-4, MA12-9, MA12-10 | MA12-2, MA12-4, MA12-9, MA12-10 |  |
| Assessment |  |  | **Trial examination** |  |  |

Note to staff

* This sample scope and sequence is designed to incorporate the department sample assessment tasks, “How are concert spaces designed?” in year 11 and “Can mathematics predict periodic phenomena?” in year 12. You can find these assessment tasks on the [Mathematics Advanced](https://education.nsw.gov.au/teaching-and-learning/curriculum/key-learning-areas/mathematics/stage-6/mathematics-advanced) page of the department website.
* The assessments included in this scope and sequence are suggestions only. You can find other sample assessment tasks on the [Mathematics Advanced](https://education.nsw.gov.au/teaching-and-learning/curriculum/key-learning-areas/mathematics/stage-6/mathematics-advanced) page of the department website or on the NESA website for [Mathematics Advanced (NEW)](https://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/stage-6-learning-areas/stage-6-mathematics/mathematics-advanced-2017).
* The duration of each unit is approximate and will need to be adapted to suit the needs of the students within your school context. The lessons developed within each unit of work have been designed to explore a key concept or main idea. The length of each lesson and number of lessons assigned to each concept will vary between school contexts and should be adapted to suit your school scope and sequence and program.
* The process of designing the scope and sequence has been underpinned by placing the topics relating to the assignment at the appropriate times first, as determined by the assessment schedule of the school. All other units have been backfilled so they knit together sequentially and iteratively with the units of this course and the Mathematics Extension 1 and 2 courses. Staff designing a scope and sequence should refer to the units of work to determine the duration and prerequisite knowledge required for each unit.