 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-F1.2Introduction to functions | MA-F1.3 Linear, quadratic and cubic functions | MA-F1.4 Further functions and relations | MA-C1Introduction 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-C1Introduction to differentiation | MA-T1Trigonometry and measure of angles | MA-T2Trigonometric 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-S1.1Probability and Venn diagrams | MA-S1.2Discrete 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-E1Logarithms and exponentials | MA-F2Graphing techniques | MA-C2.1Differentiation of trigonometry, exponential and logarithmic functions | MA-C2.2Rules of differentiation | MA-C4.1The 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-C3.1The first and second derivatives | MA-C3.2Applications of the derivative | MA-C4.2Areas and the definite integrals | MA-T3Trigonometric 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-S2.1Data (grouped and ungrouped) and summary statistics | MA-S2.2 Bivariate data analysis | MA-C3.1Continuous random variables  | MA-C3.2The 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-M1.1Modelling investments and loans | MA-M1.2Arithmetic sequences and series | MA-M1.3Geometric sequences and series | MA-M1.4Financial 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.