# Pre-approved Learning and Assessment Plan

Stage 2 Mathematical Methods (aligns with Program 2)

Pre-approved learning and assessment plans are for *school use only*.

* Teachers may make changes to the plan, retaining alignment with the subject outline.
* The principal or delegate endorses the use of the plan, and any changes made to it, including use of an addendum.
* The plan does not need to be submitted to the SACE Board for approval.

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| School |  | Teacher(s) |  |

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| SACE school code | | |  | Year |  | Enrolment code | | | | |  | Program variant code (A–W) |
| Stage | Subject code | | | No. of credits (10 or 20) |
|  |  |  |  | **2** | **M** | **H** | **S** | **20** |  |

Addendum – changes made to the pre-approved learning and assessment plan

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| Describe any changes made to the pre-approved learning and assessment plan to support students to be successful in meeting the requirements of the subject. In your description, please explain:  what changes have been made to the plan   * the rationale for making the changes * whether these changes have been made for all students, or for individuals within the student group. |

Endorsement

The use of the learning and assessment plan is approved for use in the school. Any changes made to the plan support student achievement of the performance standards and retain alignment with the subject outline.

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| Signature of principal or delegate |  | Date |  |

# Assessment overview

Stage 2 Mathematical Methods – 20 credits

The table below provides details of the planned tasks and shows where students have the opportunity to provide evidence for each of the specific features of all of the assessment design criteria.

Assessment Type 1: Skills and Applications Tasks – weighting 50%

| Assessment details | Assessment design criteria | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
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| CT | RC |
| SAT 1: Differential Calculus Test (no technology)  Students demonstrate mathematical knowledge and skills from Topic 1. The content covers key questions and key concepts within subtopics 1.1, 1.2, and 1.5.  A range of routine and some complex questions will require students to apply their knowledge and skills gained throughout their study. Clear and logical communication of their solutions and the correct use of notation and terminology are required. Use of electronic technology (calculators) and handwritten notes are not permitted for the entire task. | 1,2 | 3,4 | Written: supervised  Time: 70 minutes  SACE formula sheet provided  Use of electronic technology and notes not permitted. |
| SAT 2: Applications of Differential Calculus Test  Students to demonstrate their knowledge and skills in understanding and appropriate use of the mathematical concepts, processes, and strategies from subtopics 1.3 and 4.1 – 4.3. Conjecture development and testing will be addressed.  Students communicate mathematical ideas and reasoning using appropriate notation, representations, and terminology. Use of electronic technology is required. | 1,2,4 | 3,4,5 | Written: supervised  Time: 70 minutes  Calculator permitted  One side of an A4 page of handwritten notes permitted. SACE formula sheet provided. |
| SAT 3: Further Differentiation Test  Students demonstrate mathematical knowledge and skills from Topic 1: subtopic 1.4.  Students apply their knowledge and skills to a range of routine and complex questions. The complex questions require students to apply the key concepts to solve problems in a variety of contexts and some require interpretation of the results. Appropriate and effective use of electronic technology is expected. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 3,4 | Written: supervised  Time: 70 minutes  Calculator permitted  One side of an A4 page of handwritten notes permitted. SACE formula sheet provided. |
| SAT 4: Normal Distribution Test  Students demonstrate mathematical knowledge and skills from Topic 5. The content covers key questions and key concepts within subtopics 5.1 – 5.3, and 6.1.  Students apply their knowledge and skills to a range of routine and complex questions. The complex questions require students to apply the key concepts to solve problems in a variety of contexts and some require interpretation of the results. Conjecture development and testing will be addressed.  Appropriate and effective use of electronic technology is expected. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,3,4,5 | Written: supervised  Time: 70 minutes  Calculator permitted  One side of an A4 page of handwritten notes permitted. SACE formula sheet provided. |
| SAT 5: Discrete Random Variables and Proportions Test  Students demonstrate mathematical knowledge and skills from Topics 2 and 6. The content covers key questions and key concepts within subtopics 2.1 – 2.3, 6.2, and 6.3.  A range of routine and some complex questions will require students to apply their knowledge and skills gained throughout their study  Clear and logical communication of their solutions and the correct use of notation and terminology are required. | 1,2,4 | 1,3,4 | Written: supervised  Time: 70 minutes  Calculator permitted  One side of an A4 page of handwritten notes permitted. SACE formula sheet provided. |
| SAT 6: Integral Calculus Test  Students demonstrate their mathematical knowledge and skills related to the key questions and key ideas within Topic 3. A range of routine and some complex questions will require students to apply their knowledge and skills gained throughout their study. Clear and logical communication of their solutions and the correct use of notation and terminology are required. | 1,2,4 | 3,4 | Written: supervised  Time: 70 minutes  Calculator permitted  One side of an A4 page of handwritten notes permitted. SACE formula sheet provided. |

Assessment Type 2: Mathematical Investigation – weighting 20%

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| Assessment details | Assessment design criteria | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| CT | RC |
| Surge and Logistic Models Investigation  This investigation is predominately based on Topics 1.  Students demonstrate their knowledge of differential calculus through exploration of the surge and logistic functions. Part A and B cover routine explorations of the basic functions. Part C includes the open-ended element of this task and invites students to explore the development of a model of their choice in a real-life context. They produce a mathematical report on their investigation. | 1,2,3,4 | 1,2,3,4,5 | Appropriate investigation report format as described in the Mathematical Methods subject outline.  Maximum of 15 single-sided A4 pages.  4 weeks to complete. Some class time is allowed to support verification. |

External Assessment: Examination – weighting 30%

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| Assessment details | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
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| External Assessment | 2 hour external examination (from November 2020)  Access to electronic technology required.  Students may refer to two unfolded A4 sheet (four sides) of hand-written notes.  A formula sheet is included in the examination booklet.  The examination is based on the key questions and key concepts in the six topics.  The examination consists of a range of problems, some focusing on knowledge, and routine skills, and applications, and others focusing on analysis and interpretation. Some problems may require students to interrelate their knowledge, skills, and understanding from more than one topic. Students provide explanations and arguments, and use correct mathematical notation, terminology, and representations throughout the examination. |

Eight assessments.Please refer to the Stage 2 Mathematical Methods subject outline.