

Pre-approved Learning and Assessment Plan

**Stage 2 Robotic and Electronic Systems (from 2022)**

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** | **R** | **E** | **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 Robotic and Electronic Systems — 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:Specialised Skills Tasks** – 20%

| Assessment details | Assessment design criteria | | | | **Assessment conditions**  (e.g. task type, word length, time allocated, supervision) |
| --- | --- | --- | --- | --- | --- |
| **IA** | **D** | **P** | **E** |
| **Specialised Skills Task 1**  (breadboard circuit)  Students produce and test a breadboard electronic system controlled by a PICAXETM program as specified by the teacher.  This task assesses the students’ level of skills in designing, producing, and testing a PICAXETM simulated program based on a circuit concept given by the teacher. Students are expected to correctly simulate their design on a breadboard and download their program into a PICAXETM microcontroller to test it. |  |  | 1,2 | 1 | The combined evidence should be a maximum of 500 words if written, or the equivalent in multimodal form |
| **Specialised Skills Task 2**  (printed circuit board)  Using CAD software students draw a printed circuit board layout for the circuit tested in specialised skills task 1.  This task assesses the students’ skills related to the use of CAD software in designing a printed circuit board layout which is then manufactured to form a satisfactorily operating circuit. |  |  | 1,2 | 1 | The combined evidence should be a maximum of 500 words if written, or the equivalent in multimodal form |

Assessment Type 2: Design Process and Product – 50%

| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| --- | --- | --- | --- | --- | --- |
| IA | D | P | E |
| **Folio**  Students create a design folio, documenting their design from conception to realisation. The folio must include  Investigation and Analysis   * A design brief that outlines functional outcomes, aesthetic considerations, constraints and a statement of intent, and identification of criteria to evaluate the success of the solution. * Investigation and critical analysis of existing products, materials and processes.   Design Development and Planning   * Sketches and technical drawings communicating design intent. * A timeline outlining the sequence of the realisation process.   **Evaluation**   * A critical comparison of the realised product with the criteria specified in the design brief, and an explanation and justification for any changes made. * Reflection on outcomes with recommendations for possible improvement or redevelopment of designs or procedures. * Evaluative observations about the student’s own skill development. | 1 | 1 |  | 1 | The evidence should be a maximum of 2000 words if written, or 12 minutes recorded oral documentation, or the equivalent in multimodal form. |
| **Solution**  Students produce the solution as designed in their folio. They produce a video or photographic record that includes evidence of:   * Development of skills. * Selection and use of appropriate processes and techniques. * Modification to the design as a result of technical problems that arise. * Ongoing reflection on ideas and procedures.   The realised solution must be showcased in the video/photographic record |  | 2 | 1, 2 |  | The evidence for the solution realisation task should be a maximum of 1000 words if written or 6 minutes of recorded oral communication, or the equivalent in multimodal form. |

Assessment Type 3: Resources Study – 30%

| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| --- | --- | --- | --- | --- | --- |
| **IA** | **D** | **P** | **E** |
| **Part One: Resource Investigation**  Students investigate and evaluate the types and properties of two or more components for a home security system. Components could include sensors, output systems, power systems, or other negotiated components The investigation involves practical testing, comparative evaluation and a summative evaluation. There should also be some information from secondary sources.  In negotiation with the teacher, students may select to present their findings in the form of tables, comparative examples, annotated displays, multimedia presentations or written reports. | 1 | 2 |  |  | The combined evidence should be a maximum of 2000 words if written, or a maximum of 12 minutes recorded oral documentation, analysis, and evaluation, or the equivalent in multimodal form. |
| **Part Two: Issue Exploration**  Students investigate and analyse ethical, legal, economic and/or sustainability issues specific to their solution.  Students may investigate and analyse one or more of the following strategies or approaches.   * Sustainability: life cycle analysis, carbon footprint, potential to reuse or recycle. * Ethical: use and application of the end product, concerns related to health and safety, discrimination, conflicts of interest, cultural influences. * Legal responsibilities: patents, safety requirements, intellectual property, creative commons, WHS legislation. * Economic considerations: costing, responsible use of resources, time management. | 2 |  |  | 1 |

*Please refer to the Stage 2 Design, Technology, and Engineering subject outline.*