# Pre-approved Learning and Assessment Plan

Stage 2 Communication Products (Context: Computer-aided Design)

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** | **C** | **C** | **B** | **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 Communication Products – 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 20%

| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| --- | --- | --- | --- | --- | --- |
| I | Pl | Pr | E |
| Specialised Skills Application 1  CAD modelling & rendering from physical product  Students are to produce the 'technical package' for their major/minor product in Autodesk Inventor CAD. For example these parts could be the drag/gear mechanism for a fishing reel, the strut/spring assembly for a suspension setup, or the bar/knuckle components for a children's playground. Students will produce individual parts, a final assembly and renderings of the product for assessment. Assessment is based on the completeness and accuracy of the CAD model/s, the CAD modelling approach used, and the quality of the finished renders.  The process allows the students to demonstrate the following application of skills and techniques, resources, equipment and materials to create the product appropriately:   * independent use of CAD software * application of appropriate CAD modelling processes to achieve accurate results * reflecting on the effectiveness of the chosen tools and processes.   The outcome of this skills task is usable for Specialised Skills Application 2 |  | 1,2 | 1,2,3 |  | Structured in supervised CAD laboratory. Students can work at own pace to complete skills according to prescribed sequence of parts to be modelled.  Three weeks of lesson time. |
| Specialised Skills Application 2  Technical drawing from CAD model  Students are required to produce a range of technical drawings (to AS1100 standard) of their CAD model which was produced in Specialised Skills Application 1. These technical drawings are to be produced using Inventor CAD software, and are to include an exploded General Assembly Drawing with Parts List, plus individual dimensioned part drawings for selected components. Students are assessed on the layout, dimensioning and detailing of these Technical Drawings with reference to the appropriate AS1100 drawing standards.  This skills task requires the students to:   * demonstrate the ability to produce technical drawings to AS11 00 standard * choose and apply an appropriate layout, scale and annotations to their technical drawings |  | 2 |  | 1,2,3 | Structured in supervised CAD laboratory. Students can work at own pace to complete technical drawings.  Three weeks of lesson time. |
| Material Application TaskCAD modelling methods and testing  Students investigate the comparative suitability of three different modelling components of a Parametric CAD package - ego models based on lofted, revolved or extruded/filleted geometry. They will base their testing on a standard product that includes complex compound surfaces (eg. a coke bottle). Students will engage in a process of research and testing to evaluate the functional characteristics of these components in a range of relevant areas.  The investigation should involve practical testing, comparative evaluation and a summative evaluation. Examples of quantitative data that could be gathered include:   * time taken to produce each part * number of modelling steps needed * number of sketch dimensions needed * net model features required, and balance of advanced/basic processes.   Examples of qualitative data that could be gathered:   * material mapping (zebra/surface analysis) * overall shape/fit to original * rendering quality (shadows, reflective mapping).   Quantitative and qualitative data should be analysed, and final recommendations given, in light of secondary (research) data collected prior to testing.  They investigate and provide information into the impact of this system on individuals, society and or the environment  Students may negotiate with the teacher to present their findings in the form of tables, comparative examples, annotated displays, multimedia presentations or written reports. Students will present, summarise and evaluate the results of their experimentation and justify their recommendation of a particular modelling approach. | 1,3,4 | 2,3 |  | 3 | Unsupervised. Students use four single lessons separated by a week of their own study time to produce their investigation.  A maximum of 800 words or 5 minutes of oral, or the equivalent in multi modal form. |

Assessment Type 2: Product – weighting 50%

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| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| I | Pl | Pr | E |
| Minor Project  Students design and produce CAD models/renderings of a product or component that will complement or be integrated into their major product. The minor product brief will be based on the design brief for the major product.  Students construct a product record and demonstrate meeting the specifications of the design brief. |  | 3 | 1,2,3 | 2 | Unstructured in supervised CAD laboratory.  Three weeks of lesson time spread over six weeks, as students begin Folio for major product. |
| Major Project  Students produce the product that they designed in their Folio task. They keep a product record that includes evidence of:   * development of skills * selection and use of appropriate components, specialized processes, and production techniques * application of knowledge and understanding to create the product * appropriate and accurate use of appropriate equipment and processes * modification of the design brief as a result of technical problems that arise * use of CAD features and processes with appropriate characteristics and properties * ongoing reflection on ideas and procedures.   Presentation of the major product will be negotiated by each student with the teacher, but will typically comprise a collection of A3 printed and annotated presentation boards, exploded assembly technical drawings or dimensioned drawings, and screen captures of CAD parts/assemblies. |  | 3 | 1,2,3 | 2 | Unstructured in supervised CAD laboratory.  The product record is used to provide evidence of modification and planning, production, and/or evaluation aspects of the design process that occur during the creation of the product.  Seven weeks. |

Assessment Type 3: Folio – weighting 30%

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| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) | |
| I | Pl | Pr | E |
| External Assessment ( two assessments for the Folio)  *Product design (documentation and analysis)*  *Students create a design brief and analyse their investigation and planning for their major product, based on the skills and activities outlined in the section ‘The Design Process’ section of the Learning Scope and Requirements .* The design brief should include a statement of intent, functional outcomes, aesthetic considerations, and constraints. It can be presented in dot point form.  The investigating part of the design process should include an investigation into the impact on individuals, society, and/or the environment of technological practices related to the type of product that the student is designing. The analysis involved in investigation can be included in the product design documentation or in the product evaluation.*.* | 1,2,3,  4,5 | 1,2,3 |  | 1,2,3,4 | 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. |
| Product evaluation:  *Students evaluate their producing skills, using evidence from the major product record in Assessment Type 2, and evaluate their realised major product.*  The evaluation should include:   * a critical comparison of the realised product with the requirements of the design brief, and an explanation of and justification for any changes made * a review of criteria, standards, reliability, safety, quality, and cost-effectiveness * reflection on outcomes, with recommendations for possible improvement or redevelopment of designs or procedures * analysis of the impact of the product on individuals, society, and/or the environment (if not part of product design documentation) * evaluative observations about the student’s own skills development.   Evidence of development, with supporting written or oral summaries that explain, analyse, and evaluate the process and product, could take the form of:   * all or sections of the product record * photographic or electronic or digitally generated materials * audiovisual evidence * materials * products * models * sketches, diagrams, or annotations.   Oral summaries may emerge from teacher-led discussion questions*.* |

*Seven or eight assessments.**Please refer to the Stage 2 Design and Technology subject outline.*