

Pre-approved Learning and Assessment Plan

Stage 2 Material Solutions (metal)

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.

School _____ Teacher(s) _____

SACE school code			Year		Enrolment code			Program variant code (A-W)	
					Stage	Subject code			No. of credits (10 or 20)
					2	X	X	X	20

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

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.

Signature of principal or delegate _____

Date _____

Assessment overview

Stage 2 Material Solutions (metal) – 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	
<p>Specialised Skills Task 1</p> <p>Metal Specialised welding: Produce an aluminium toolbox using a supplied working plan and specialised MIG and/or TIG welding.</p> <p>The construction allows the students to demonstrate the following application of skills and techniques, resources, equipment and materials to create the product safely:</p> <ul style="list-style-type: none"> • use of machinery • use of different aluminium sections and plate • welding of aluminium at all intersections for maximum strength • use of sheet steel with the corners joined to maximise strength. <p>Students document skill development in practise welding activities through photographic evidence with recorded oral discussion or written comments. Student evaluate their learning in undertaking the task through one or more capabilities and state its relevance in the design and realisation process.</p>			1	1	Evidence for each task should be provided in multimodal form to a maximum of 3 minutes or 500 words in written format
<p>Specialised skills task 2</p> <p>Use pieces of scrap metal to demonstrate proficiency at the following techniques using a metal lathe: Chamfering, Parting, Threading, Boring, Drilling, and Knurling.</p> <p>The construction requires the students to demonstrate safe application of skills and techniques, resources, equipment and materials to create a product.</p> <p>Students evaluate their skill development for each technique undertaken and provide recommendations for improvements. Photographic evidence of the completed technique is required. Student evaluate their learning in undertaking the task through one or more capabilities and state its relevance in the design and realisation process</p>			1,2	1	Evidence for each task should be provided in multimodal form to a maximum of 3 minutes or 500 words in written format

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	
<p>Task 1; Design brief with evidence of investigation and analysis (refer to content: design and realisation process diagram and explanation of components pages 31 of subject outline)</p> <p>The design brief should include a statement of intent, identification of a problem or opportunity, functional outcomes, aesthetic considerations, and constraints. It can be presented in dot point form. Students define criteria to evaluate how well the finished product meets the requirements of the design brief.</p> <p>Students select one strategy below for investigating an aspect or aspects related to their design brief that will inform their design development;</p> <ul style="list-style-type: none"> analysing existing product or system characteristics and features to inform the design and realisation process collecting and analysing data from a target audience e.g. survey, questionnaire researching and analysing information from different contexts such as the manufacturing sector or emerging advanced technologies researching historical design or period influences or different cultural traditions conducting peer review and feedback about the design brief. critically analysing sources of information for reliability and validity. 	1	1			<p>The task(s) must include a showcase and evaluation of the solution or product in the form of a video or photographic record. The rest of the evidence may be completed in written or multimodal form. The task(s) should be up to a total maximum of 2000 words or the equivalent in multimodal form where 6 minutes is equivalent to 1000 words.</p>
<p>Task 2; Design development and planning</p> <p>Students document their design ideas and make plans to use the available resources such as time, materials and technologies to realise the product or system. They test, adapt and validate the design prior to product realisation</p> <p>Students select one strategy below to show design development and planning required:</p> <ul style="list-style-type: none"> creating working drawings, concept sketches, prototypes, story boards, flow charts, simulation or 3D modelling. working collaboratively face to face or online to develop imaginative, innovative, and enterprising outcomes e.g. with peers, industry, tertiary education or community applying interdisciplinary concepts e.g. artistic, scientific, mathematical and engineering skills appropriate to the planning and designing of the product or system preparing timelines and procedures using visual organisers such as Gantt charts and tables showing sequencing creating a table, chart or diagram to define product specifications e.g. measurement, materials to be used, processes required. 		2			

Assessment details	Assessment design criteria				Assessment conditions (e.g. task type, word length, time allocated, supervision)
	IA	D	P	E	
<p>Task 3 : Product realisation and evaluation</p> <p>Students produce the product/ solution that they designed. <u>Students must showcase and evaluate the solution or product in the form of a video or photographic record.</u> Evidence required needs to focus on:</p> <ul style="list-style-type: none"> development of skills selection and use of appropriate components, specialised processes, and production techniques application of knowledge and understanding to create the product safe and accurate use of appropriate equipment and processes modification of the design brief as a result of technical problems that arise use of materials with appropriate characteristics and properties ongoing reflection on ideas and procedures. <p>The evaluation should include:</p> <ul style="list-style-type: none"> a critical comparison of the realised product with the criteria specified in the design brief, and an explanation of and justification for any changes made a review of criteria, standards, reliability, safety, quality, and cost-effectiveness of product reflection on outcomes, with recommendations for possible improvement or redevelopment of designs or procedures evaluative observations about the student's own skill development. 			1,2	1	

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	
<p>Part One: Resource Investigation</p> <p>Students investigate and analyse the functional characteristics and properties of two or more materials or components they are considering for use in the creation of their solution. They report on how their research into and testing of the functional characteristics and properties of these materials or components will affect their selection for use in the realisation of their solution.</p> <p>e.g. Properties and testing of TIG and MIG welds</p> <p>Students investigate the properties of welds produced by the two different welding processes: Tungsten Inert Gas welding and Metal Inert Gas welding. They look at the chemical properties of the metal and gases involved, and the implications for the type of weld produced.</p>	1	2			

Assessment details	Assessment design criteria				Assessment conditions (e.g. task type, word length, time allocated, supervision)
	IA	D	P	E	
<p>Part 2: Issues exploration</p> <p>Students investigate and analyse ethical, legal, economic and/or sustainability issues specific to their solution</p> <p>Students may investigate and analyse using one or more of the following strategies or approaches;</p> <ul style="list-style-type: none"> • sustainability: life cycle analysis, carbon footprint, potential to reuse or recycle, fair trade, customs, carbon footprint • ethical use and application of the end product • ethical concerns related to health and safety, discrimination, social media, advertising, data, images, conflicts of interest, • historical and cultural influences including social trends, the changing nature of work, technological change • legal responsibilities- patents, safety requirements, intellectual property, creative commons, Australian International Standard , regulations and legislation including OH&S, safety of the product for the user • economic considerations: costing of products including materials, labour and equipment and machinery, responsible use of resources, products built to last, time management and material availability <p>Students evaluate this information and respond to potential publishing or entrepreneurship opportunities of their product or solution e.g. patents, marketing and distribution, mass production, online publishing, crowd sourcing</p>	2			1	<p>The Resource Study should be presented in written or multimodal form or a combination of both. It should be up to a maximum of 2000 words if written or the equivalent in multimodal form, where 1000 words is equivalent to 6 minutes.</p>

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