



**COURSE OUTLINE**  
**MATERIAL, DESIGN & TECH METAL – GENERAL YEAR 12: 2021**  
**UNIT 3 AND UNIT 4**



This course will run the two units, 3 and 4, concurrently. The student Semester 1 grade will therefore be an estimate.

Term and Weeks	Topic and key teaching points	Syllabus content	Assessments
Term 1 Weeks 1-5	Design	<p><b>Design</b>  <b>Design fundamentals and skills</b></p> <ul style="list-style-type: none"> <li>• investigate           <ul style="list-style-type: none"> <li>▪ designs in practice</li> <li>▪ needs, values and beliefs of the designer/developer</li> <li>▪ sources of design inspiration</li> <li>▪ performance criteria for products</li> <li>▪ application of design fundamentals and factors affecting design               <ul style="list-style-type: none"> <li>○ aesthetics</li> <li>○ function</li> <li>○ cost</li> <li>○ measurements</li> <li>○ environmental impact and considerations</li> <li>○ safety</li> </ul> </li> </ul> </li> <li>• devise           <ul style="list-style-type: none"> <li>▪ using communication and documentation techniques               <ul style="list-style-type: none"> <li>○ sketching and drawing</li> <li>○ rendering</li> <li>○ annotating</li> </ul> </li> <li>▪ understanding the elements and principles of design where applicable in context               <ul style="list-style-type: none"> <li>○ line</li> <li>○ shape</li> <li>○ form</li> <li>○ texture</li> <li>○ contrast</li> <li>○ proportion</li> <li>○ balance</li> <li>○ colour</li> </ul> </li> <li>▪ rapid concept development techniques to generate design ideas and concepts</li> <li>▪ final design concept using design brief and performance criteria</li> </ul> </li> </ul>	<p><i>Workshop Safety Induction N/A</i>  <i>Task 1: Parts Tray Design Folio</i>  <i>Task 3: Parts Tray</i>  <i>Task 7: Oxy Weld Exercises</i></p>



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		<ul style="list-style-type: none"><li>▪ review of best idea using design brief and performance criteria</li><li>▪ design solution<ul style="list-style-type: none"><li>○ develop best concept using annotated hand or computer generated graphics (front, back views and detailed sketches as necessary)</li><li>○ 2D illustrations (working/technical drawings)</li><li>○ 3D illustration (presentation drawings)</li><li>○ inspiration/concept/storyboard</li></ul></li><li>▪ production plans<ul style="list-style-type: none"><li>○ materials list</li><li>○ costing for all materials components</li><li>○ time line for stages of production</li></ul></li><li>• evaluate<ul style="list-style-type: none"><li>▪ final product against design brief, initial design and performance criteria related to needs, values and beliefs of the end user</li></ul></li></ul> <p><b>Use of technology</b></p> <p><b>Skills and techniques</b></p> <ul style="list-style-type: none"><li>• ICT, portfolio development and communication skills<ul style="list-style-type: none"><li>▪ photography – ongoing record of progress and processes used and final product</li><li>▪ documenting presentations and evaluations</li></ul></li><li>• context appropriate drawing and relevant technical information to produce the final product to demonstrate:<ul style="list-style-type: none"><li>▪ sketching rapid concept developments</li><li>▪ 3D presentation drawings</li><li>▪ rendering techniques</li><li>▪ 2D working drawings or using templates</li><li>▪ inspiration/concept or storyboard development and presentation</li><li>▪ design and making specification sheets</li></ul></li><li>• select appropriate materials and calculate the quantities of materials required to complete the project</li><li>• with supervision, operate machinery and tools appropriate to context</li></ul>		
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		<p><b>Safety</b></p> <ul style="list-style-type: none"> <li>• correct use of personal protective equipment (PPE) where applicable</li> <li>• occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops</li> <li>• apply risk management strategies in the workshop/studio</li> <li>• assess the condition of tools and machinery</li> </ul> <p><b>Production management</b></p> <ul style="list-style-type: none"> <li>• production planning             <ul style="list-style-type: none"> <li>▪ maintain a production plan</li> <li>▪ maintain time management while using tools, equipment and machinery to complete production                 <ul style="list-style-type: none"> <li>○ follow instructions from plans</li> <li>○ maintain safety requirements</li> </ul> </li> <li>▪ record changes to materials lists or costing</li> <li>▪ record regular journal/diary entries</li> </ul> </li> <li>• ongoing evaluation techniques: diary, journal or portfolio notes and use of photography, to record ongoing progress/decision changes made to the project</li> </ul>								
<p>Term 1 Weeks 1-5</p>	<p><b>Materials</b></p>	<p><b>Materials</b></p> <p><b>Nature and properties of materials</b></p> <ul style="list-style-type: none"> <li>• investigate metals             <ul style="list-style-type: none"> <li>▪ ferrous                 <ul style="list-style-type: none"> <li>○ functional differences between low, medium, high carbon steels, cast iron</li> </ul> </li> </ul> </li> <li>• metal structure             <ul style="list-style-type: none"> <li>▪ physical characteristics of mild steel</li> </ul> </li> <li>• metal alloy types and classifications             <ul style="list-style-type: none"> <li>▪ ferrous – steel, cast iron</li> <li>▪ non-ferrous – aluminium alloys, copper alloys, nickel alloys</li> </ul> </li> <li>• identification of the different common cross sections and sizes of metals from the             <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">▪ wire</td> <td style="width: 33%;">▪ hexagonal</td> <td style="width: 33%;">▪ round tube</td> </tr> <tr> <td>▪ rod</td> <td>• octagonal bar</td> <td>▪ square tube</td> </tr> </table> </li> </ul>	▪ wire	▪ hexagonal	▪ round tube	▪ rod	• octagonal bar	▪ square tube	<p><b>Task 2: Tool Box Folio</b>  <b>Task 4: Tool Box</b>  <b>Task 7: Oxy Weld Exercises</b></p>	
▪ wire	▪ hexagonal	▪ round tube								
▪ rod	• octagonal bar	▪ square tube								



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		<ul style="list-style-type: none"> <li>▪ flat</li> <li>▪ square</li> <li>• aesthetic properties             <ul style="list-style-type: none"> <li>▪ lustre</li> <li>▪ colour</li> <li>▪ texture</li> </ul> </li> <li><b>Design</b></li> <li><b>Design fundamentals and skills</b></li> <li>• investigate             <ul style="list-style-type: none"> <li>▪ designs in practice</li> <li>▪ needs, values and beliefs of the designer/developer</li> <li>▪ sources of design inspiration</li> <li>▪ performance criteria for products</li> <li>▪ application of design fundamentals and factors affecting design                 <ul style="list-style-type: none"> <li>○ aesthetics</li> <li>○ function</li> <li>○ cost</li> <li>○ measurements</li> <li>○ environmental impact and considerations</li> <li>○ safety</li> </ul> </li> </ul> </li> <li>• devise             <ul style="list-style-type: none"> <li>▪ using communication and documentation techniques                 <ul style="list-style-type: none"> <li>○ sketching and drawing</li> <li>○ rendering</li> <li>○ annotating</li> </ul> </li> <li>▪ understanding the elements and principles of design where applicable in context                 <ul style="list-style-type: none"> <li>○ line</li> <li>○ shape</li> <li>○ form</li> <li>○ texture</li> <li>○ contrast</li> <li>○ proportion</li> <li>○ balance</li> <li>○ colour</li> </ul> </li> <li>▪ rapid concept development techniques to generate design ideas and concepts</li> <li>▪ final design concept using design brief and performance criteria</li> </ul> </li> </ul>		
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		<ul style="list-style-type: none"><li>▪ review of best idea using design brief and performance criteria</li><li>▪ design solution<ul style="list-style-type: none"><li>○ develop best concept using annotated hand or computer generated graphics (front, back views and detailed sketches as necessary)</li><li>○ 2D illustrations (working/technical drawings)</li><li>○ 3D illustration (presentation drawings)</li><li>○ inspiration/concept/storyboard</li></ul></li><li>▪ production plans<ul style="list-style-type: none"><li>○ materials list</li><li>○ costing for all materials components</li><li>○ time line for stages of production</li></ul></li><li>• evaluate<ul style="list-style-type: none"><li>▪ final product against design brief, initial design and performance criteria related to needs, values and beliefs of the end user</li></ul></li></ul> <p><b>Use of technology</b></p> <p><b>Skills and techniques</b></p> <ul style="list-style-type: none"><li>• ICT, portfolio development and communication skills<ul style="list-style-type: none"><li>▪ photography – ongoing record of progress and processes used and final product</li><li>▪ documenting presentations and evaluations</li></ul></li><li>• context appropriate drawing and relevant technical information to produce the final product to demonstrate:<ul style="list-style-type: none"><li>▪ sketching rapid concept developments</li><li>▪ 3D presentation drawings</li><li>▪ rendering techniques</li><li>▪ 2D working drawings or using templates</li><li>▪ inspiration/concept or storyboard development and presentation</li><li>▪ design and making specification sheets</li></ul></li><li>• select appropriate materials and calculate the quantities of materials required to complete the project</li><li>• with supervision, operate machinery and tools appropriate to context</li></ul>		
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		<p><b>Production management</b></p> <ul style="list-style-type: none"> <li>• production planning           <ul style="list-style-type: none"> <li>▪ maintain a production plan</li> <li>▪ maintain time management while using tools, equipment and machinery to complete production               <ul style="list-style-type: none"> <li>○ follow instructions from plans</li> <li>○ maintain safety requirements</li> </ul> </li> <li>▪ record changes to materials lists or costing</li> <li>▪ record regular journal/diary entries</li> </ul> </li> <li>• ongoing evaluation techniques: diary, journal or portfolio notes and use of photography, to record ongoing progress/decision changes made to the project</li> </ul> <p><b>Use of technology</b></p> <p><b>Skills and techniques</b></p> <ul style="list-style-type: none"> <li>• select and apply appropriate and accurate marking out tools and techniques for measuring and marking out in sheet metal, bar and tube projects, that include the use of:           <ul style="list-style-type: none"> <li>▪ rule</li> <li>▪ square</li> <li>▪ scribe</li> <li>▪ centre punch</li> <li>▪ inside/outside callipers</li> <li>▪ combination squares</li> </ul> </li> <li>• select and safely apply technical skills using a range of tools and machinery, that could include:           <ul style="list-style-type: none"> <li>▪ hand tools for shaping</li> <li>▪ files and filing</li> <li>▪ hacksaws and blades</li> <li>▪ metal lathe</li> <li>▪ vice and clamps</li> <li>▪ hand tools for cutting</li> <li>▪ electric hand drill</li> <li>▪ drill press/pedestal drill</li> </ul> </li> </ul> <p><b>Materials in context</b></p> <ul style="list-style-type: none"> <li>• name and operate machines for folding and shaping metals</li> <li>• apply correct methods of gas and electric metal welding</li> </ul>		
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		<ul style="list-style-type: none"> <li>▪ metal preparation</li> <li>▪ welding operations</li> <li>• physical properties             <ul style="list-style-type: none"> <li>▪ ductility</li> <li>▪ malleability</li> <li>▪ hardness</li> <li>▪ tensile strength</li> </ul> </li> <li>▪ set up</li> <li>▪ testing</li> </ul>		
Term 1 Weeks 7-8	<b>Safety</b>	<b>Safety</b> <ul style="list-style-type: none"> <li>• correct use of personal protective equipment (PPE) where applicable</li> <li>• conduct risk assessment for using specific tools/machinery</li> <li>• demo occupational safety and health (OSH) practices appropriate to tasks being undertaken/workshops</li> <li>• apply risk management strategies in the workshop/studio</li> <li>• recognise need and purpose of materials safety data (MSD) with regard to storage and handling of hazardous substances and hazardous operations appropriate to situation</li> </ul>		<b>Task 2: Tool Box Folio</b> <b>Task 4: Tool Box</b> <b>Task 7: Oxy Weld Exercises</b> <b>Task 11: OSH Worksheet</b>
Term 1 Week 9	<b>Materials</b>	<b>Materials</b> <ul style="list-style-type: none"> <li>• <b>Nature and properties of materials</b></li> <li>• investigate metals             <ul style="list-style-type: none"> <li>▪ ferrous               <ul style="list-style-type: none"> <li>○ functional differences between low, medium, high carbon steels, cast iron, cast steel</li> </ul> </li> </ul> </li> <li>• metal structure             <ul style="list-style-type: none"> <li>▪ physical characteristics of mild steel</li> </ul> </li> <li>• metal alloy types and classifications             <ul style="list-style-type: none"> <li>▪ ferrous – steel, cast iron</li> </ul> </li> </ul> non-ferrous – aluminium alloys, copper alloys, nickel alloys		<b>Task 2: Tool Box Folio</b> <b>Task 4: Tool Box</b> <b>Task 7: Oxy Weld Exercises</b> <b>Task 10: Ferrous, Non-Ferrous and Fixings Work sheet</b>



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<p>Term 2 Weeks 1-2</p>	<p><b>Use of technology</b></p>	<p><b>Use of technology</b> <b>Skills and techniques</b></p> <ul style="list-style-type: none"><li>• select and apply appropriate and accurate marking out tools and techniques for marking out in sheet metal, bar and tube projects, that include the use of:<ul style="list-style-type: none"><li>▪ rule</li><li>▪ square</li><li>▪ scribe</li><li>▪ centre punch</li><li>▪ inside/outside callipers</li><li>▪ combination squares</li></ul></li><li>• select and safely apply technical skills using a range of tools and machinery, that<ul style="list-style-type: none"><li>▪ hand tools for shaping</li><li>▪ files and filing</li><li>▪ hacksaws and blades</li><li>▪ metal lathe</li><li>▪ vice and clamps</li><li>▪ hand tools for cutting</li><li>▪ electric hand drill</li><li>▪ drill press/pedestal drill</li></ul></li></ul> <p><b>Materials in context</b></p> <ul style="list-style-type: none"><li>• name and operate machines for folding and shaping metals</li><li>• apply correct methods of gas and electric metal welding<ul style="list-style-type: none"><li>▪ metal preparation</li><li>▪ set up</li><li>▪ welding operations</li><li>▪ testing</li></ul></li></ul>	<p><b>Task 2: Tool Box Folio</b> <b>Task 4: Tool Box</b> <b>Task 7: Oxy Weld Exercises</b> <b>Task 12: Tools Checklist work sheet</b></p>
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<p style="text-align: center;">Term 2 Weeks 3-4</p>	<p><b>Use of technology</b></p>	<p><b>Use of technology</b></p> <ul style="list-style-type: none"> <li>• <b>Skills and techniques</b></li> <li>• select and apply appropriate and accurate marking out tools and techniques for measuring and marking out in sheet metal, bar and tube projects, that include the use of:             <ul style="list-style-type: none"> <li>▪ rule</li> <li>▪ square</li> <li>▪ scribe</li> <li>▪ centre punch</li> <li>▪ inside/outside callipers</li> <li>▪ combination squares</li> </ul> </li> <li>• select and safely apply technical skills using a range of tools and machinery, that could include:             <ul style="list-style-type: none"> <li>▪ hand tools for shaping</li> <li>▪ files and filing</li> <li>▪ hacksaws and blades</li> <li>▪ vice and clamps</li> <li>▪ hand tools for cutting</li> <li>▪ electric hand drill</li> </ul> </li> </ul>	<p><b>Task 4: Tool Box</b>  <b>Task 8: MIG Welding Exercises</b></p>
<p style="text-align: center;">Term 2 Weeks 5-11</p>	<p><b>Production management</b></p>	<p><b>Production management</b></p> <ul style="list-style-type: none"> <li>• production planning             <ul style="list-style-type: none"> <li>▪ maintain a detailed production plan</li> <li>▪ maintain time management while using tools, equipment and machinery to                 <ul style="list-style-type: none"> <li>○ adhere to sequential instructions</li> <li>○ apply safety and risk management</li> </ul> </li> <li>▪ record changes to materials lists or costing</li> <li>▪ record regular journal/diary entries</li> </ul> </li> <li>• ongoing evaluation techniques: diary, journal or portfolio notes and use of photos to document ongoing progress/decision changes made to the project</li> </ul> <p><b>Use of technology</b></p> <p><b>Skills and techniques</b></p> <ul style="list-style-type: none"> <li>• operate machinery and tools appropriate to context</li> <li>• identify, remove and report blunt, dull or damaged tools and machinery appropriate to context</li> </ul> <p><b>Design</b></p>	<p><b>Task 2: Tool Box Folio</b>  <b>Task 4: Tool Box</b>  <b>Task 8: MIG Welding Exercises</b></p>



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		<p><b>Design fundamentals and skills</b></p> <ul style="list-style-type: none"><li>• investigate<ul style="list-style-type: none"><li>▪ needs, values and beliefs of the designer/developer</li><li>▪ needs, values and beliefs of the client/target audience/market</li><li>▪ performance criteria related to needs, values and beliefs of the end user</li><li>▪ application of design fundamentals and factors affecting design<ul style="list-style-type: none"><li>○ aesthetics</li><li>○ function</li><li>○ cost</li><li>○ critical measurements</li><li>○ environmental impact and considerations</li><li>○ safety</li></ul></li></ul></li><li>• devise<ul style="list-style-type: none"><li>▪ communication and documentation techniques<ul style="list-style-type: none"><li>○ sketching and drawing</li><li>○ rendering</li><li>○ annotating</li><li>○ sampling</li><li>○ modelling</li></ul></li><li>▪ applying of elements and principles of design where applicable in context</li><li>▪ rapid concept development techniques, images and annotation</li><li>▪ design development<ul style="list-style-type: none"><li>○ review and justification of best ideas using design brief and performance criteria</li><li>○ best ideas developed using annotated hand or computer generated graphics (front, back views and detailed sketches as necessary)</li><li>○ 2D illustrations (working/technical drawings)</li><li>○ 3D illustration (presentation drawings)</li><li>○ inspiration/concept/storyboard development and presentation</li></ul></li><li>▪ production plan<ul style="list-style-type: none"><li>○ materials list</li><li>○ estimated and actual costing for all materials and components</li><li>○ production plan and time line</li></ul></li></ul></li></ul>		
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		<ul style="list-style-type: none"><li>• evaluate<ul style="list-style-type: none"><li>▪ design and production processes</li><li>▪ production plan/journal/diary and accompanying photographic evidence to record ongoing evaluation</li><li>▪ product against design brief, initial design and performance criteria related to needs, values and beliefs of the end user</li></ul></li></ul> <p><b>Use of technology</b></p> <p><b>Skills and techniques</b></p> <ul style="list-style-type: none"><li>• ICT, portfolio development and communication skills<ul style="list-style-type: none"><li>▪ client and market research techniques</li><li>▪ client presentation techniques</li><li>▪ photography – ongoing record of progress and processes used and final product</li><li>▪ documenting presentations and evaluations</li></ul></li><li>• develop context appropriate drawings and relevant technical information to produce the final product<ul style="list-style-type: none"><li>▪ sketching rapid concept developments</li><li>▪ 3D presentation drawings</li><li>▪ 2D working drawings or using templates</li><li>▪ inspiration/concept or storyboard development and presentation</li><li>▪ design and making specification sheets</li></ul></li><li>• use workroom/studio terminology appropriate to context select appropriate materials and calculate the correct amount required to order and purchase materials to complete the project</li></ul>		
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Term 2 Weeks 6-11	<b>Use of technology</b>	<p><b>Use of technology</b>  <b>Skills and techniques</b></p> <ul style="list-style-type: none"> <li>• select and apply appropriate and accurate marking out tools and techniques for marking out in sheet metal, bar and tube projects, that include the use of:           <ul style="list-style-type: none"> <li>▪ rule</li> <li>▪ square</li> <li>▪ scribe</li> </ul> <ul style="list-style-type: none"> <li>▪ centre punch</li> <li>▪ inside/outside callipers</li> <li>▪ combination squares</li> </ul> </li> <li>• select and safely apply technical skills using a range of tools and machinery, that           <ul style="list-style-type: none"> <li>▪ hand tools for shaping</li> <li>▪ files and filing</li> <li>▪ hacksaws and blades</li> <li>▪ metal lathe</li> </ul> <ul style="list-style-type: none"> <li>▪ vice and clamps</li> <li>▪ hand tools for cutting</li> <li>▪ electric hand drill</li> <li>▪ drill press/pedestal drill</li> </ul> </li> </ul> <p><b>Materials in context</b></p> <ul style="list-style-type: none"> <li>• apply methods of drilling different metals           <ul style="list-style-type: none"> <li>▪ preparations for drilling</li> <li>▪ drill speeds</li> <li>▪ lubricants for different metals</li> </ul> </li> <li>• select and apply appropriate methods of fixing metals together through permanent joining, that could include:           <ul style="list-style-type: none"> <li>▪ welding</li> <li>▪ types of nuts and bolts</li> </ul> <ul style="list-style-type: none"> <li>▪ riveting</li> <li>▪ screws</li> </ul> </li> <li>• name and operate a powered cutting machine or mechanical cutting device</li> </ul> <p><b>Use of technology</b>  <b>Skills and techniques</b></p> <ul style="list-style-type: none"> <li>• handle and store sectional tube, bar and sheet metal and material correctly</li> <li>• select and apply appropriate and accurate marking out tools and techniques for marking out in sheet metal, bar and tube projects</li> <li>• ensure safety guards and devices are fitted correctly before operating a machine</li> </ul>	<b>Task 5: Machine Vice</b>
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		<ul style="list-style-type: none"> <li>• select and apply technical skills using a range of tools and machinery</li> <li>• select and safely apply technical skills using a range of tools and machinery that could include:             <ul style="list-style-type: none"> <li>▪ cutting, shaping and folding techniques</li> <li>▪ adjusting and changing components of machinery</li> <li>▪ welding equipment, both gas and electric</li> <li>▪ pedestal grinder</li> <li>▪ metal lathe and basic manual and/or automatic turning operations</li> </ul> </li> <li>• prepare metal surfaces for finishing apply a metal finish</li> </ul> <p><b>Safety</b></p> <ul style="list-style-type: none"> <li>• correct use of personal protective equipment (PPE) where applicable</li> <li>• conduct risk assessment for using specific tools/machinery</li> <li>• demonstrate occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops</li> <li>• apply risk management strategies in the workshop/studio</li> <li>• recognise need and purpose of materials safety data (MSD) with regard to storage and handling of hazardous substances and hazardous operations appropriate to situation</li> <li>• apply a metal finish</li> </ul>		
Term 3 Weeks 1-3	<b>Materials in context</b>	<b>Materials in context</b> <ul style="list-style-type: none"> <li>• the environmental impact of metals production             <ul style="list-style-type: none"> <li>▪ raw material extraction and processing – steel and aluminium</li> <li>▪ end-of-life of a product – recycling and safe disposal</li> </ul> </li> </ul> examples of re-cycling methods for different metal materials <b>Safety</b> <ul style="list-style-type: none"> <li>• correct use of personal protective equipment (PPE) where applicable</li> <li>• conduct risk assessment for using specific tools/machinery</li> <li>• demonstrate occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops</li> <li>• apply risk management strategies in the workshop/studio</li> </ul>	<b>Task 5: Machine Vice</b> <b>Task 13: Sustainable Materials work sheet</b>	



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		recognise need and purpose of materials safety data (MSD) with regard to storage and handling of hazardous substances and hazardous operations appropriate to situation	
Term 3 Weeks 6-8	<b>Use of technology</b>	<p><b>Use of technology</b>  <b>Skills and techniques</b></p> <ul style="list-style-type: none"> <li>• select and safely apply technical skills using a range of tools and machinery that could include: <ul style="list-style-type: none"> <li>▪ cutting, shaping and folding techniques</li> <li>▪ adjusting and changing components of machinery</li> <li>▪ welding equipment, both gas and electric</li> </ul> </li> </ul> <p>pedestal grinder</p>	<p><b>Task 5: Machine Vice</b>  <b>Task 9: Arc Welding Exercises</b></p>
Term 3 Weeks 4-7	<b>Materials</b>	<p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• <b>Nature and properties of materials</b> <ul style="list-style-type: none"> <li>• applications of the following metal finishes <ul style="list-style-type: none"> <li>▪ painting</li> <li>▪ galvanising</li> <li>▪ lacquering</li> <li>▪ enamelling</li> <li>▪ tin plating</li> <li>▪ electroplating</li> <li>▪ anodising</li> <li>▪ plastic or powder coatings</li> </ul> </li> </ul> </li> </ul>	<p><b>Task 14: Identification Aesthetics</b>  <b>Work sheet</b>  <b>Task 5: Machine Vice</b>  <b>Task 9: Arc Welding Exercises</b></p>



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**MATERIAL, DESIGN & TECH METAL – GENERAL YEAR 12: 2021**  
**UNIT 3 AND UNIT 4**



Term 3 Weeks 7-10	<b>Safety</b>	<b>Safety</b> <ul style="list-style-type: none"> <li>• correct use of personal protective equipment (PPE) where applicable</li> <li>• conduct risk assessment for using specific tools/machinery</li> </ul> demonstrate occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops	<b>Task 6: Trivet</b> <b>Task 9: Arc Welding exercises</b>								
Term 3 Weeks 8-10	<b>Materials</b>	<b>Materials</b> <b>Nature and properties of materials</b> <ul style="list-style-type: none"> <li>• the properties of materials             <ul style="list-style-type: none"> <li>▪ non-ferrous – copper, aluminium</li> </ul> </li> <li>• the properties of steel using the following terms             <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">▪ malleable</td> <td style="width: 50%;">▪ corrosion resistance</td> </tr> <tr> <td>▪ ductile</td> <td>▪ thermal conductivity</td> </tr> <tr> <td>▪ hardness</td> <td>▪ electrical conductivity</td> </tr> <tr> <td>▪ brittleness</td> <td></td> </tr> </table> </li> <li>• relationship between properties and end uses of metals</li> <li>• identification of thread types, taps and dies</li> </ul>	▪ malleable	▪ corrosion resistance	▪ ductile	▪ thermal conductivity	▪ hardness	▪ electrical conductivity	▪ brittleness		<b>Task 9: Arc Welding exercises</b>
▪ malleable	▪ corrosion resistance										
▪ ductile	▪ thermal conductivity										
▪ hardness	▪ electrical conductivity										
▪ brittleness											
Term 4 Weeks 1	<b>Use of technology</b> <b>Skills and techniques</b>	<ul style="list-style-type: none"> <li>• select and safely apply technical skills using a range of tools and machinery that could include:             <ul style="list-style-type: none"> <li>▪ cutting, shaping and folding techniques</li> <li>▪ adjusting and changing components of machinery</li> <li>▪ welding equipment, both gas and electric</li> <li>▪ pedestal grinder</li> </ul> </li> </ul>	<b>Task 6: Trivet</b> <b>Task 9: Arc Welding exercises</b>								



**COURSE OUTLINE**  
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