



### Learning Aims and Curriculum Intent:

Design and Technology offers a broad and inclusive curriculum that has been meticulously designed for A-level, pupils study this course split into two, the technical principles, which is covered as part of a set of designated theoretical lessons, and the design and making principles, which is a compilation of mini projects. Pupils are expected to undergo a design process, building confidence in the use of workshop machines, tools and equipment to ultimately design and manufacture a series of high-quality product solution for a specific client. Pupils will produce electronic design portfolios, showcasing an array of skills from analysis to research, iterative designs to prototype modelling and conducting a vast number of tests with critical evaluation.

| Term       | Technical Principles   | Design and Making Principles   | Skills  | Assessment   |
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| Michaelmas | <b>Topics:</b> <ul style="list-style-type: none"> <li>Materials and their applications</li> <li>Performance characteristics of materials</li> <li>Enhancement of materials</li> <li>Forming redistribution and addition processes</li> <li>The use of finishes</li> <li>Modern and industrial scale of practice</li> <li>Digital design and manufacture</li> </ul> | <b>1) How can ergonomics influence the success of a design?</b> <ul style="list-style-type: none"> <li>Ergonomic Craft Knife</li> </ul> <b>2) Is function or form more superior when designing?</b> <ul style="list-style-type: none"> <li>Soap Dish Holder</li> </ul>                 | <ul style="list-style-type: none"> <li>Drawn design, development, and presentation.</li> <li>Primary research pages</li> <li>Prototype modelling using different materials, using workshop tools / equipment.</li> <li>Manufacturing a high-quality product solution.</li> </ul>  | <ul style="list-style-type: none"> <li>Initial sketches</li> <li>Design development</li> <li>Rendering</li> <li>Ergonomics Research</li> <li>Packaging Design</li> <li>Jelutong model</li> <li>Personal and client Evaluation</li> </ul>   |
| Lent       | <ul style="list-style-type: none"> <li>Requirement for product design and development</li> <li>Design methods and processes</li> <li>Design theory</li> <li>Health and safety</li> <li>Protecting designs and intellectual property</li> </ul>   | <b>3) How can products encourage a spiritual mood and improve mental health?</b> <ul style="list-style-type: none"> <li>Incense Pod</li> </ul>   | <ul style="list-style-type: none"> <li>Primary research pages</li> <li>Planning</li> <li>Initial concepts</li> <li>Iterative design and development</li> <li>Consumer review</li> <li>CAD drawing and technical data</li> <li>Scale modelling</li> <li>Manufacturing using a range of different materials, workshops tools and equipment.</li> </ul>  | <ul style="list-style-type: none"> <li>Product analysis</li> <li>Anthropometrics and ergonomics research</li> <li>Design movement</li> <li>Research summary</li> <li>Design brief and specification</li> <li>Initial concepts, iterative design and development</li> <li>CAD/CAM</li> <li>Manufacturing diary</li> <li>Manufacturing a high-quality product solution.</li> </ul> |
| Trinity    | <ul style="list-style-type: none"> <li>Design for manufacturing, maintenance, repair and disposal</li> <li>Feasibility studies</li> <li>Enterprise and marketing in the development of products</li> <li>Design communication</li> <li>End of year exam and feedback</li> </ul>  | <b>4) What is the benefits of using CAD / CAM to design and manufacture everyday products?</b> <ul style="list-style-type: none"> <li>SolidWorks, 3D Printing and Laser Cutting.</li> <li>Skills, Knowledge and Enhancement Course</li> <li>Launch of the major Year 13 NEA</li> </ul> | <ul style="list-style-type: none"> <li>Creating bespoke designs using SolidWorks as a computer aided design software.</li> <li>Rendering final CAD drawings to a realistic lifelike quality.</li> <li>Setting up and safely using the laser cutter and 3D printers to independently.</li> <li>Choosing a suitable contextual challenge for the major A-level project and linking this with a client that encounters a genuine problem.</li> </ul> | <ul style="list-style-type: none"> <li>Designs created as parts, joined in assembly and technical drawings produced.</li> <li>Final design produced as a fully rendered CAD drawing.</li> <li>Operating, adjusting the speed and power settings independently.</li> <li>Range of small items manufactured in a workshop</li> </ul>   |

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| <b>Examples of Homework</b> | Research the topic of ergonomics and relate your findings back to the focus point: ergonomics in craft knife design.<br>Produce a QA (Quality Assurance) Table for the design and manufacture of your soap dish.<br>Produce an evaluation that is centred on your target client taking into consideration their thoughts and ideas and making your own design recommendations based on their input. |
| <b>Key terminology</b>      | Design Brief, Rapid Designs, CAD, CAM, 2D-Design, Communication, Mix Media, Prototype, Compliant Materials, Ergonomics, Anthropometrics, Materials, Properties, Finish, Quality Assurance, Quality Control, Client, End User, Target Market. Thermoforming, Laser Cutter, 3D Printer, Brazing Hearth,   |

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| <p><b>Super-curricular enrichment and scholarly extension</b></p> | <p><b>Read:</b><br/>           Sketching: Drawing Techniques for Product Designers by Roselien Stuer.<br/>           Manufacturing Processes for Design Professionals (2007) by Rob Thompson.</p> <p><b>Watch:</b><br/>           James Dyson Answers Design Questions from Twitter<br/> <a href="https://youtu.be/zFCFe38EIfE?feature=shared">https://youtu.be/zFCFe38EIfE?feature=shared</a></p> <p><b>Listen:</b><br/>           Nuts and Bolts Seven Small Invention That Changed the World (in a Big Way) – Roma Agrawal<br/> <a href="https://www.99percentinvisible.org">Nuts and Bolts - 99% Invisible (99percentinvisible.org)</a></p> <p><b>Visit:</b><br/>           Design Museum 224-238 Kensington High Street, London, W8 6AG<br/>           New Designers Exhibition (3<sup>rd</sup> – 6<sup>th</sup> July 2024) Business Design Centre, 52 Upper Street, London, N1 0QH</p> |  |
| <p><b>Useful websites</b></p>                                     | <p>Toyota production system explains the origins and philosophy behind modern manufacturing systems such as ‘Just in Time’.<br/> <a href="#">Toyota Production System   Vision &amp; Philosophy   Company   Toyota Motor Corporation Official Global Website</a><br/>           How adhesive products work and why adhesives do not stick to the container.<br/> <a href="#">How do adhesives and glues work?   The science of sticking (explainthatstuff.com)</a></p>   |  |
| <p><b>Who can I contact?</b></p>                                  | <p><b>Head of Design and Technology</b></p>  | <p>Mr H Ibrahim, <a href="mailto:hi@forest.org.uk">hi@forest.org.uk</a></p>          |
|   | <p><b>Teachers</b></p>   | <p>Mr J Luton-Nicholas, <a href="mailto:jln@forest.org.uk">jln@forest.org.uk</a></p> |