Pearson A Level Design Technology – The British School Kathmandu. 2 Year Curriculum overview

Year 12 Term 1 Aug-Oct Deshain	Year 12 Term 2 Oct-Dec Tihar	Year 12 Term 3 Jan-April Holi/Easter	Year 12 Term 4 April-July	Year 13 Term 1&2 Aug-Dec	Year 13 Term 3 Jan-April
Component 1: Principles of Design and Technology 50% weighting	**Component 1: Principles of Design and Technology**	**Component 1: Principles of Design and Technology**	**Component 1: Principles of Design and Technology**	**Component 1: Principles of Design and Technology**	**Component 1: Principles of Design and Technology**
Students will be required to apply knowledge and understanding of a wide range of materials; including	Students must have a sound working knowledge of the use of ICT and systems and control, including modern	Mock exam	Next steps transition Students must have a sound working knowledge of the use of ICT and systems	Designers from the past provide inspiration for present and future designing. Students should be aware of	External exam The assessment is 2 hours and 30 minutes and marked out of 120.

modern and smart materials, and processes used in product design and manufacture. They will be required to develop an understanding of contemporary industrial and commercial practices applied to designing and manufacturing products, and to appreciate the risks involved.	manufacturing processes and systems, and students will be expected to understand how these might be applied in the design and manufacture of products.		and control, including modern manufacturing processes and systems, and students will be expected to understand how these might be applied in the design and manufacture of products.	the important contribution that key historical movements and figures have on modern design thinking.	The paper will include calculations, short-open, open-response and extended-writing questions
Skills/Techniques/Learning: **Hardwoods:** oak, mahogany, beech, jelutong, balsa**.** **Softwoods:** pine, cedar, larch, redwood. **Metals:** ferrous metals – mild steel, carbon steels, cast	**Skills/Techniques/Learning:** **Polymers:** thermoplastics, acrylic, polyethylene, polyethylene terephthalate (PET), polyvinyl chloride (PVC), polypropylene (PP), acrylonitrile butadiene styrene	**Skills/Techniques/Learning:** **Papers and boards**: drawing papers, layout, tracing, copier, cartridge. Commercial printing papers, bond, coated. Boards, mounting board, corrugated board,	**Skills/Techniques/Learning:** **2. Performance characteristics of materials** **3. Processes, techniques and specialist tools** **4. Digital technologies**	**Skills/Techniques/Learning:** **6. Effects of technological developments** **7. Safe working practices, potential hazards and risk assessment**	**Skills/Techniques/Learning:** **9. Designing for maintenance and the cleaner environment** **10. Current legislation** **11. Information handling, modelling**

iron Non-ferrous metals – aluminium, copper, zinc, tin. Alloys (ferrous and non-ferrous) – stainless steel, duralumin, brass. **Textiles:** natural fibres – cotton, linen, wool. Manmade fibres – nylon, polypropylene, polyester. Textile treatments – flame resistant, polytetrafluoroethylene (PTFE).	(ABS) **Thermosetting plastics:** epoxy resins (ER), urea formaldehyde (UF), polyester resin (PR). c) elastomers – rubber. **Composites:** carbon fibre (CFRP), glass fibre (GRP), Medium Density Fiberboard (MDF), hardboard, chipboard, plywood.	foam board, folding box board, foil-lined board. **Smart and modern materials:** thermo-ceramics, shape memory alloys (SMA), reactive glass, liquid crystal displays (LCD, photo-chromic materials, thermo-chromic materials, quantum tunnelling composites.	**5. Factors influencing the development of products**	**8. Features of manufacturing industries**	**and forward planning** **12. Further processes and techniques**

Prototype: Design and make

Students are to undertake a substantial design, make and evaluate project which will test students' skills in designing and making a prototype.

The term 'prototype' means an appropriate working solution to a need or want that is sufficiently developed to be tested and evaluated (for example, full-sized products, scaled working models or functioning systems)

Students are required to individually and in consultation with a client/end user identify a design possibility and design context from which they develop a range of potential solutions and then realise one through practical making activities. The project must allow candidates to apply knowledge and understanding in a product development process to design, make and evaluate prototypes.					
Component 2: Design and make project		**Component 2: Design and make project**		**Component 2: Design and make project/ NEA coursework submission**	
Part 1: Identifying and outlining possibilities for design **1. Identification and investigation of a design possibility** -Investigation of the needs, wants and values of the client/end user. -Identification, investigation and justification of a design possibility. **2. Investigation of needs and research** - Assess the needs, wants and values of	**1-2 Skills/Evidence: Investigate the client/user needs, wants and values -** learn about a broad range of user needs, wants and values that could be addressed **Identify and investigate a design possibility** – refine the scope of possibilities down to a focused area based on investigations **Justify design possibility** – provide a rationale as to how and why the design	**3. Specification** - Production of a refined design brief based on outcomes of research and investigations, a technical design specification considering form, function, sustainability and standards relevant to the needs, wants and values of the intended client/end user. - Evidence of client/end user influence in the specification.	**3. Skills/Evidence: Identify** and Justify performance requirements providing a rationale as to how they have been determined to ensure a working solution to the design **Create** a refined design brief and specification must be produced that reflects the needs, wants and values of the client/end user.	**4. Design ideas** - Production of a range of design Proposals that are realistic, workable, and which address the criteria in the specification. - Exploration of different design approaches, processes and techniques to produce realistic design ideas. - Selection and application of design strategies and knowledge of	**4. Skills/Evidence: Select** and **apply** design strategies - Consider different strategies and select them through their relevance to the design possibility and related factors and their ability to work effectively with design ideas presented. Demonstrate an ability to use the selected strategies to generate and produce design ideas. **Present design ideas–** demonstrate an

the client/end user and the needs of the prototype - Research of existing commercial products, using knowledge and understanding of designing and making. - User-centred design, identified design possibility, design context, and the needs, wants and values of the client/end user - Consideration of levels of production and potential methods to improve the sustainability of the prototype across its life cycle.	possibility has been identified **Assess** client/user needs, wants and values and the needs of the prototype – consider all of the factors that have been investigated **Select** research sources and make links between the design needs and the research undertaken	- Identification and justification of performance requirements for the prototype. - Consideration of scale of manufacture and how this reflects on relevant cost.	● Purpose/function ● Form ● User requirements ● Performance requirements (considering relevant standards) ● Material and component requirements ● Scale of manufacture and cost	materials and/or components, processes and techniques to produce design ideas that address client/end user needs, wants and values. - Design ideas show consideration and use of aesthetics, including cultural and historical influences. - Decisions made in consultation with the client/end user	ability to solve a design problem. **Incorporate** aesthetic understanding into features of designs Demonstrate understanding of materials, processes, techniques and the intended use of the prototype – show an ability to select and apply relevant knowledge in the context of designing new prototypes to demonstrate understanding of its appropriate use in practice
Part 2: Design a prototype **5. Development of design Ideas**	**5. Skills/Evidence:** **Use** research – draw from information and understanding gained	**6. Final design solution** - Design proposals are refined and design	**6. Skills/Evidence:** **Refine** design proposals – **Make** final and present a	**8. Communication of design ideas** Selection and skill in the use of	**8. Skills/Evidence:** **Select** and **use** communication techniques - Consider

- Demonstration of an iterative approach to design development. This is informed by the application of knowledge of materials and the needs, wants and values of the client/end user. - Modelling/simulation used to test appropriate features including proportions, scale, function, subsystems. Modelling/simulation can be achieved through the use of traditional materials, or 2D and/or 3D computer simulations. - Ongoing developmental changes are informed by technical application of	from research to inform ongoing developmental changes. **Use** an iterative approach – planning, experimenting, designing, modelling, testing and reviewing, including use of input from client/end user to inform decision making, make improvements and refine designs at each stage of development. **Apply knowledge** of materials and processes - show an ability to use relevant technical knowledge to inform the development of designs **Apply** modelling/simulation techniques – use of modelling/simulation	solutions include all requirements including technical details of all materials and/or component parts, processes and techniques. - Specification of materials and/or components and processes shows consideration of sustainability, prototype manufacture, lifespan and disposal. - Application of the calculation and cost of materials based on quantities to reduce wastage. **7. Review of development and final idea** - Critical analysis and evaluation of their own ideas	single design solution that meets the requirements of the design specification. **Produce** a manufacturing full specification, including technical information to allow accurate interpretation by a third party. **Apply** calculations – using appropriate mathematical knowledge **Demonstrate understanding** of methods of reducing wastage **7. Skills/Evidence:** **Analyse** a range of factors including materials and/or components, processes, techniques, aesthetics and	traditional/manual graphical, digital techniques (CAD), written techniques to communicate designs.	different communication techniques and make considered choices about which are most fit for purpose based on their ability to clearly and accurately convey design information and related factors. Demonstrate an ability to use the selected communication techniques accurately in order to effectively communicate all aspects of design proposals. - Evidence to support the marks awarded in this section will be found in both the development of design ideas and the final design solution sections of the

research, experimenting, and client/end user feedback in order to improve, refine and realise a design.	as part of an iterative design approach to visualise developing designs and inform decisions **Demonstrate** understanding of the need for testing - show an ability to select and apply knowledge of relevant testing methods in the context of designing new prototypes in order to demonstrate understanding of its importance in the development of a final prototype.	- Analysis and evaluation of designs and prototypes/products **-** Evaluation of refinements to designs based on the design decisions made by others, including the client/end user **-** Draw conclusions based on the analysis and evaluation, drawing together considerations about the appropriateness of the final prototype in meeting the needs of the specification.	contextual/historical influences supported by reference to feedback. **Evaluate** refinements made to designs through the development process **Analyse** designs and prototypes made by others and **make connections** between elements of the design **Evaluate** designs and prototypes made by others including strengths & weaknesses.		portfolio. Notes and annotations should provide sufficient information to enable others to interpret their design intentions.
Component 2: Design and make project		**Component 2: Design and make project**		**Component 2: Design and make project/ NEA coursework submission**	

Part 3 Making a final prototype: **9. Tools and equipment** - Production of a high-quality prototype that is appropriate to an advanced level of demand, meeting the requirements of the design specification. **-** Selection and technical skill in application of material, range of tools, techniques, fixtures, components and finishes used in the manufacture of the final prototype. - Demonstration of safe working practice, including for self and others with whom they may be working. - Demonstration of an iterative approach to the manufacture of the final prototype.	**9 Skills/Evidence:** **Select** materials, fixtures, components and fittings **Demonstrate understanding** of material properties, the requirements of the client/end user, and the intended purpose of the prototype **Use tools, equipment and techniques** – Selecting tools, equipment and techniques for the manufacture of the final prototype **Demonstrate understanding** of the need for dimensional and geometric accuracy	**10 Skills/Evidence:** **Demonstrate** safe working practices, document the ways in which the tools, equipment, processes and techniques are used during the making **Demonstrate making skills** in the production of a functional prototype **Produce** a functional prototype – present and fully document the physicality and functionality of a completed prototype showing how it addresses the client/end user needs and requirements of the design specification **Apply** an iterative approach to manufacture - employ a process of planning,	**11. Testing and evaluating** - An analysis of the prototype is performed that includes testing against the specification. - Evaluation of the prototype in meeting the needs, wants and values of the client/end user and specification. - An analysis and evaluation of the impact on the environment, including life-cycle analysis of the final prototype. x	**11. Skills/Evidence:** **Analyse** the final prototype with consideration and investigation of materials and/or components, processes, techniques, aesthetics and contextual/historical influences. Reference to feedback, the design specification, and testing against measurable criteria. **Evaluate** and critically review the final prototype using information gained from analysis of the final manufactured prototype, including strengths, weaknesses and the effectiveness of the iterative process. **Analyse** the potential social, moral, ethical and environmental	Key stages of the manufacturing process are photographed in order to demonstrate that the prototype is an appropriate working solution to the identified client/end user. Annotated photographs, written responses or represented data related to market research/field trials as evidence of testing undertaken.

10. Accuracy - Measuring, determining, and applying a degree of accuracy and precision required for prototypes to perform as intended.		experimenting, making, testing and reviewing		impacts of the prototype. **Evaluate** the impact of the prototype - critically review the potential social, moral, ethical and environmental impacts of the prototype.	

Health and Safety

MRAT

Literacy Opportunities:	Opportunities for developing the 5Cs
Speaking & Listening- Self/Peer/ Group evaluation, Literacy Foci and critique Written: Artist analysis, sentence and paragraph structure, Reflection and Evaluation Reading- - Key words, Key vocabulary, Starter sentences, Analysing symbols and meanings, Literacy foci Visual literacy: line, shape, colour, form, motion, texture, pattern, direction, orientation, scale, angle, space and proportion	Creativity: Design cycle, Prototyping, CAD Confidence: Use of materials, ergonomics Compassion: Understanding of movement, function and context. Health and Safety. Sustainability. Community: Discussion of work, peer and group written feedback. Challenge: Mastery of tools, equipment, processes.

Cross curricular:

Students are encouraged to make interdisciplinary links as part of their personal investigations in addition to:

Mathematics – Proportion, Measurement and Scale

Psychology: Symbolism. meaning, narrative.

Geography - Sustainability
Art and Design - Colour Theory, Aesthetics and Form
Sociology - Moral, Social and Political

Notes:

Calendar events:

Submission deadlines: