A Level Product Design Curriculum 2023 - 2024

	Year 12			Year 13		
	Knowledge and skills	Enrichment	Cross-Curricular	Knowledge and skills	Enrichment	Cross-curricular
Cycle 1	**Theory** topics: **3.1 Technical principles** **3.1.1 Materials and their applications** • Classification of materials • Methods for investigating and testing materials **3.1.2 Performance characteristics of materials** • Performance characteristics of papers and boards • Performance characteristics of polymer based sheet and film • Performance characteristics of woods • Performance characteristics of metals • Performance characteristics of polymers • Elastomers • Biodegradable polymers • Composites • Smart materials • Modern materials **3.1.3 Enhancement of materials – wood, polymers, metals** **3.2.2 Design theory** • Design influences • Design styles and movements • Designers and their work **Practical** skills project: **Step stool project**, key focus on the manufacture of wood joints, quality control checks, safety standards and wood finishes. **Independent Study:** Independent research into range of products incorporating smart and modern materials	independence and evaluation/critical thinking: analysing a brief. Independent research to inform design projects		**3.1.11 Design for manufacturing, maintenance, repair and disposal** • Manufacture, repair, maintenance and disposal • Ease of manufacture • Disassembly **3.1.12 Feasibility studies** **3.1.13 Enterprise and marketing in the development of products** **3.1.14 Design communication** **3.1.15 Modern manufacturing systems** **3.2 Designing and making principles** **3.2.1 Design methods and processes** **Iterative design process** Continue **NEA** - **Section C:** Development of design proposal - **Section D:** Developing of design prototype **Independent Study:** Analysis of products from a range of design movements. Independent research tasks: Margaret Calvert & James Dyson **Ethos and Vision:**	independence and evaluation/ critical thinking: analysing a brief. Problem solving Independent research to inform design projects	

	Ethos and Vision:					
Cycle 2	**3.1.4 Forming, redistribution and addition processes** • Paper and board forming processes • Polymer processes • Metal processes **3.1.4.6 The use of adhesives and fixings** Jigs and fixtures **3.1.4.4 The use of adhesives and fixings** • Wood processes **3.1.5 The use of finishes** • Paper and board finishing • Paper and board printing processes • Polymer finishing • Metal finishing • Wood finishing **3.2.3 How technology and cultural changes can impact on the work of designers** • Socio economic influences • Major developments in technology • Social, moral and ethical issues **3.2.3.4 Product life cycle** **Practical** skills project: **Eco Design** – focus on designing and manufacturing an environmentally friendly product of student's choice set by a real life client. **Independent Study:** Revise properties of papers and boards, printing methods. **Ethos and Vision**	independence and evaluation/critical thinking: analysing a brief. Problem solving Independent research to inform design projects		**3.2.4 Design processes (re-cap with links to NEA work)** • The use of a design process • Prototype development • The iterative design process in industrial or commercial contexts **3.2.5 Critical analysis and evaluation** • Testing and evaluating products in commercial products • Use of third party feedback in the testing and evaluation process **3.2.6 Selecting appropriate tools, equipment and processes** **3.2.7 Accuracy in design and manufacture** **3.2.9 Design for manufacture and project management** • Planning for accuracy and efficiency • Quality assurance • Quality control Continue **NEA** • **Section D:** Developing of design prototype • **Section E:** Analysing and evaluating • Submission of NEA **Independent Study:** Selection of exam style questions on topics covered during the course. **Ethos and Vision:**	independence and evaluation/ critical thinking: analysing a brief. Problem solving Independent research to inform design projects	

Cycle 3	**3.1.6 Modern industrial and commercial practice** • Scales of production **3.1.6.2 Efficient use of materials** • The use of computer systems Sub-assembly **3.1.7 Digital design and manufacture** • Computer aided design (CAD) • Computer aided manufacture (CAM) • Virtual modelling • Rapid prototyping processes • Electronic data interchange Production, planning and control (PPC) networking **3.1.8 The requirements for product design and development** • Product development and improvement • Inclusive design **3.1.9 Health and safety** • Safe working practices • Safety in products and services to the customer **3.1.10 Protecting designs and intellectual property** **3.2.8 Responsible design** • Environmental issues • Conservation of energy and resources **3.2.10 National and international standards in product design** (no longer need to teach 'NAPM recycled mark' from September 2022) NEA: • **Section A:** Identify and investigate design possibilities • **Section B:** Producing design brief and specification • **Section C:** Development of design proposal **Independent Study:**	independence and evaluation/critical thinking: analysing a brief. Problem solving Independent research to inform design projects		**Revision for examined units based on assessment of needs.** **Independent Study:** **Ethos and Vision:**		

	Case study of companies using circular economy model. **Ethos and Vision**					