A Level Product Design Curriculum 2023 - 2024

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