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:** |  |  |