A-LEVEL – YEAR 13 – DESIGN TECHNOLOGY – CURRICULUM OVERVIEW

Autumn Term		Spring Term		Summer Term
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**
Key Themes	**Key Themes**	**Key Themes**	**Key Themes**	**Key Themes**
Principles of Design and Technology Topics 8: **8: Features of manufacturing industries** **Characteristics and stages of the following methods of production when applied to products and materials:** a) one-off production b) batch production c) high-volume production. **Quality monitoring systems:** a) quality control – the monitoring and achieving of high standards and degree of tolerance by inspection and testing, computer-aided testing b) quality assurance – monitoring the quality of a product from its design and development stage, through its manufacture, to its end-use performance and degree of customer satisfaction. c) Total Quality Management (TQM) – when applied to quality assurance procedures and its impact on employees at every stage of the production process, ISO 9000. **Small, medium and large scale production:** a) production scheduling and production logistics b) robotics in production – robots on fully-automated production and assembly lines/cells c) materials handling systems – automated storage and retrieval systems (ASRS), automatic guided vehicles (AGVs) d) flexible manufacturing systems (FMS), modular/cell production systems e) lean manufacturing using just-in-time (JIT) systems f) standardised parts, bought-in components g) quick response manufacturing (QRM) h) data integration – product data management (PDM), enterprise resource planning (ERP) systems i) concurrent manufacturing.	**Principles of Design and Technology Topics 9:** **9: Advantages and disadvantages of 'cleaner' design and technology and a product's life cycle** a) material selection – source, quantity, quality, range, recyclability, biodegradability b) manufacture – minimising energy use, simplification of processes, achieving optimum use of materials and components, giving consideration to material form, cost and scale of production c) distribution – efficient use of packaging, reduction of transport, alternatives to fossil fuels d) use – repair versus replacement, energy efficiency, efficiency ratings e) repair and maintenance standardisation, modular construction, bought in parts f) end of life – design for disassembly, recovered material collection, sorting and re-processing methods, energy recovery, environmental implications of disposal to landfill. **The wider issues of using cleaner technologies:** a) cost implications to the consumer and manufacturer b) sustainability – designing without jeopardising the potential for people in the future to meet their needs.	**Principles of Design and Technology Topics 10:** **10: Current legislation** a) Consumer Rights Act (2015) b) Sale of Goods Act (1979). **Health and safety laws and regulations:** a) health and safety regulation – the Health and Safety Executive and an awareness of relevant regulations to manufacturing industries b) Health and Safety at Work etc Act (1974) – the procedures to safeguard the risk of injury to people: personal protective equipment (PPE), signage, warning symbols c) Control of Substances Hazardous to Health (COSHH) regulations – the storage and use of solvent-based substances containing volatile organic compounds (VOCs).	**Principles of Design and Technology Topics 11 & 12:** **11: Information handling, Modelling and forward planning.** a) marketing – marketing analysis, research techniques, raw data/analysed data to enable enterprise to be encouraged b) innovation management – cooperation between management, designers and production engineers, the encouragement of creativity c) the use of feasibility studies on the practicability of proposed solutions. Modelling the costing of projects to achieve an optimum outcome: a) budgets – undertake financial forecasts b) planning for production – allocation of: o employees o materials o scale of production c) selection of appropriate tools, machines and manufacturing processes. Intellectual property rights of designers, inventors and companies: a) patents b) copyrights c) design rights d) trademarks. a) British Standards (BSI and kite mark) b) European (CEN and CE) c) International Standards (ISO).	**Principles of Design and Technology Topics 12 & Revision.** **12: Further processes and techniques** a) user-centred design, framework process, problem solving, user needs, wants and values, limitations of end user consideration b) circular economy – biologically-based systems and an understanding of how waste and pollution can be eliminated c) systems thinking – the influence of systems on commercial activity to enable all elements of a manufacturing enterprise to work together. **Project Management** a) critical path analysis – the handling of complex and time sensitive operations b) scrum – how flexible, holistic product development is achieved c) Six Sigma – the improvement of output quality of a process by identifying and removing the causes of defects and setting value targets of: reduce process cycle time, reduce pollution, reduce costs, increase customer satisfaction, increase profits. **Stages of a product's life cycle:** Introduction Stage ● Growth Stage ● Maturity Stage ● Decline Stage. **Extended writing practice.**
Assessment / Composite Tasks	**Assessment / Composite Tasks**	**Assessment / Composite Tasks**	**Assessment / Composite Tasks**	**Assessment / Composite Tasks**
Component 2 - NEA Design/Develop Topic 11&12 Information/Standards and Further Processes	**Component 2 NEA - Advanced CAD Rendering/Orthographic Drawings**	**Component 2 NEA - Modelling of Prototypes**	**Component 2 NEA - Manufacture of Prototype**	**Component 2 NEA - Evaluation & Final Submission.** **Component 1 - Exam preparation and revision. Past Papers and Extended Responses**

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