

Term	INTENT	IMPLEMENTATION	IMPACT
Edexcel- Design Technology/ Product Design	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic to gain substantive knowledge.	Assessment opportunities What assessments will be used to measure student progress? Evidence of how well students have learned the intended content.
Year 12 Term 1 Introduction to A level Course	Introduction to the course and focus on foundational skill. Drawing Skills: Isometric, Orthographic, single- and two-point perspective, Oblique. CAD - Sketch a Day [Timed Activity with peer reflection]- Isometric shapes and Sketches online Perspective Using 2D Design Isometric using 2D Design C.AD Skills: Google Sketchup/ Solid works, 2D Design Isometric Shapes replicated on CAD Designer Chair: Interior Design-Kitchen and Living Room using Sketchup Interior Design-Kitchen and living room using Sketchup Introduction to Orthographic- Dimensioning Freehand and 2D Design Assembly Drawings Exploded Drawings Orthographic 1st Angle and Third Angle- Using Skills 2 Work Sheet.	Designing Skills To understand the basic design principles of line, form and colour and their application in designing. To develop and use design briefs, detailed specifications and criteria in relation to product development. To consider the conflicting demands that moral, cultural, economic, environmental, historical and social issues can make in the planning and in the designing of products. To consider their own health and safety and that of makers, manufacturers, individual users and society at large. To consider an increasing range of users of products and different societies in relation to their differing needs and values. To anticipate and design for product maintenance. To design for manufacturing in quantity. To plan for quality control and quality assurance when designing products and to be aware of the difference To generate design proposals against stated design criteria, and to modify their proposals in the light of on-going analysis, evaluation and product development.	Weekly homework Classwork Marked Peer and self-assessment End of project assessment

	Complete at least 15 Shapes to scale including dimensioning Pen/Peg/Key board mouse/remote - Controlled selection of products made available for students to prepare presentations on their chosen products. Students select product & analyse: Research, Specifications, Materials, alternatives, Manufacture 1.1 Product Analysis/ Research Introduction to A level mark scheme The teaching of FORM and FUNCTION will be undertaken as part of the designer's study. SFPT H&S Tasks linked to make a complete product Designing a prototype: <i>Bike Storage</i> Intro / Mark Scheme Development, Modelling, Drawing, Rendering Visit to Greenwich Park and Town Centre Approaches to designing. Initials Design Skills, Drawing <i>Bike Storage- Investigate, Design, Development and Modelling</i>	To use graphic techniques and ICT, including CAD to generate, develop, model and communicate design proposals. to match materials and components with tools, equipment and processes, taking account of critical dimensions and tolerances when deciding how to manufacture the product. to produce and use detailed working schedules that will achieve the desired objectives in the time available, setting realistic deadlines for the various stages of manufacture, identifying critical points in the making process and providing alternatives to possible problems. To devise and apply test procedures to check the quality of their work at critical points during • To ensure that the quality of their design solution will be suitable for intended clients and To understand the difference between quality of design and quality of manufacture and use essential criteria to evaluate the quality of products they have made and products which have been made commercially. Modelling To be able use modelling to represent and understand complex systems. This involves creating visual or physical models that illustrate how different components interact and function within a system. To be able to integrate knowledge from various sources. They can combine concepts, theories, and practical skills to create comprehensive models that reflect real-world scenarios. To be able to explain relationships among concepts, structures, or species. For example, they might create a model to demonstrate the ecological interactions within an ecosystem. To be able to visualize dynamic processes. They can create models that show changes over time, such as growth, decay, or movement.	
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		Evolution of the product To be able to recognise that products evolve over time because of developments in ideas, materials, manufacturing processes and technologies as well as because of social changes. To be able to recognise that design movements and cultural influences are still influencing new product development. To be aware that manufacturing industries are involved in continuous improvement (CI) and this is a major influence in product evolution. To be aware that sometimes new products are developed because of marketing pull and sometimes because of technological push;	
Term Tealight Holder Passive Speaker	Passive Speaker Mood board/Inspiration page Design proposals (3 Ideas) - Freehand/2D Design or Sketchup Summary of research/conclusion Design Specification for your product Key Dimensions of the phone you are going to use (with or without the cover) Make a card model (corrugated card) of your idea to test the feasibility. Research/Investigate the materials [Wood manufactured boards] and the associated manufacturing techniques that is suitable for the material. Draw a technical drawing of the product you are going to manufacture [2D Design or Freehand] Create a parts list.	Designing Skills To understand the basic design principles of line, form and colour and their application in designing. To develop and use design briefs, detailed specifications and criteria in relation to product development. To consider the conflicting demands that moral, cultural, economic, environmental, historical and social issues can make in the planning and in the designing of products. To consider their own health and safety and that of makers, manufacturers, individual users and society at large. To consider an increasing range of users of products and different societies in relation to their differing needs and values. To anticipate and design for product maintenance. To design for manufacturing in quantity. To plan for quality control and quality assurance when designing products and to be aware of the difference	Weekly homework Classwork Marked Peer and self-assessment End of project assessment

	Design in Google SketchUp or Fusion 360 for the Final Idea Make - Use the correct tools and equipment for marking out and cutting. Review of design Tea light Card model for a tea light holder Templates Investigation on the tools Using Design Influences	To generate design proposals against stated design criteria, and to modify their proposals in the light of on-going analysis, evaluation and product development. To use graphic techniques and ICT, including CAD to generate, develop, model and communicate design proposals. to match materials and components with tools, equipment and processes, taking account of critical dimensions and tolerances when deciding how to manufacture the product. to produce and use detailed working schedules that will achieve the desired objectives in the time available, setting realistic deadlines for the various stages of manufacture, identifying critical points in the making process and providing alternatives to possible problems. To devise and apply test procedures to check the quality of their work at critical points during • To ensure that the quality of their design solution will be suitable for intended clients and To understand the difference between quality of design and quality of manufacture and use essential criteria to evaluate the quality of products they have made and products which have been made commercially. Making Skills To match materials and components with tools, equipment and processes to produce quality products. To use tools and equipment safely, accurately and efficiently to achieve an appropriate fit, finish and reliable functioning in products that match their specifications. To use a range of industrial applications when working with familiar materials and processes. To use a range of industrial applications when working with familiar materials and processes.	
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Term 3 Unit 2 Lamp Task	Lamp Task Design and Make a Tea light holder that will suspend a tea light in the middle of a jam jar. Write a specification for Tea light holder. Design ideas including models made from paper card to scale (Materials, Manufacture and Construction Techniques. Produce a final idea – with clear reasons why (Orthographic Technical Plan /Planning) Research/Investigate the Materials that you can use. Explain how the product will be manufactured. Manufacturing Diary including correct use of tools and equipment Card Model completed for Tea light Holder	Designing Skills To understand the basic design principles of line, form and colour and their application in designing. To develop and use design briefs, detailed specifications and criteria in relation to product development. To consider the conflicting demands that moral, cultural, economic, environmental, historical and social issues can make in the planning and in the designing of products. To consider their own health and safety and that of makers, manufacturers, individual users and society at large. To consider an increasing range of users of products and different societies in relation to their differing needs and values. To anticipate and design for product maintenance. To design for manufacturing in quantity. To plan for quality control and quality assurance when designing products and to be aware of the difference	Weekly homework Classwork Marked Peer and self-assessment End of project assessment

	Making a final prototype: Manufacture and realisation of a final prototype, including tools and equipment and quality and accuracy. Skills/ Materials / Manufacture Photography Key factors Materials to use Mild Steel [Sheet, Tube, Box Section and Rod] Aluminium [Sheet, Tube, Box Section and Rod] Correct selection and use of Marking out and cutting tools Methods of joining Brazing, Pop Rivets, Nuts and Bolts Finishing Files, Wet and Dry [Silicon Carbide Paper], Emery Cloth, Metal Polish, Acrylic Spray Paint, Metal Spray Paint, Dip Coating Templates Making - Marking-out and cutting – Mild Steel • Marking out tools Cutting tools, Semi-Permanent Joining techniques Permanent Joining Techniques- Brazing, Hard Soldering, Soft Soldering [including use of specialist tools].	To generate design proposals against stated design criteria, and to modify their proposals in the light of on-going analysis, evaluation and product development. To use graphic techniques and ICT, including CAD to generate, develop, model and communicate design proposals. to match materials and components with tools, equipment and processes, taking account of critical dimensions and tolerances when deciding how to manufacture the product. to produce and use detailed working schedules that will achieve the desired objectives in the time available, setting realistic deadlines for the various stages of manufacture, identifying critical points in the making process and providing alternatives to possible problems. To devise and apply test procedures to check the quality of their work at critical points during • To ensure that the quality of their design solution will be suitable for intended clients and To understand the difference between quality of design and quality of manufacture and use essential criteria to evaluate the quality of products they have made and products which have been made commercially. Making Skills To match materials and components with tools, equipment and processes to produce quality products. To use tools and equipment safely, accurately and efficiently to achieve an appropriate fit, finish and reliable functioning in products that match their specifications. To use a range of industrial applications when working with familiar materials and processes. To manufacture products singly and in quantity, including the practical application of quality control and quality assurance techniques.	
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	Heat Treatments-Hardening and tempering, case hardening, annealing, normalising. Finishing [paints, anodising, electro-plating, powder coating, oil coating, galvanisation, cathodic protection, dip-coating. Evaluating own design and prototype Testing Hand in Finished	To use computer-aided manufacture (CAM) in single item production and in batch or volume production. To simulate production and assembly lines including the use of ICT; To be adaptable in their working practices, to respond to changing circumstances and new opportunities; To ensure, through testing, modification and evaluation, that the quality of their products is suitable for intended users and devise modifications where necessary that would improve performance. Combining Materials To learn how materials can be combined and processed to create more useful, or desirable, properties. To learn how these properties are utilised in industrial contexts To learn how a range of materials are prepared for manufacture, allowing for waste and fine finishing. To learn about a variety of self-finishing and applied-finishing processes and appreciate their importance for aesthetic and functional reasons. To be able to achieve the optimum use of materials and components, account needs to be taken of the complex inter-relationships between materials, form and manufacturing processes. To learn how pre-manufactured standard components are used to improve the effectiveness of the manufacturing process. Evolution of the product To be able to recognise that products evolve over time because of developments in ideas, materials, manufacturing processes and technologies as well as because of social changes. To be able to recognise that design movements and cultural influences are still influencing new product development.	
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Year 12 Term 1&2 Part 1: Identifying and outlining possibilities for design 4.1 Digital Technologies (b) CAM & rapid prototyping pg. 63-65 6.1 Effects of Technological developments (a) Mass production pg. 42, 52 (b) Industrial age pg. 110-112 (c) Global marketplace pg. 115,116 8.1 Characteristics and stages of methods of production when applied	<i>Investigate client, wants and values – ask pertinent questions and seek answers to learn about a broad range of user needs, wants and values that could be addressed and gain an understanding of related design considerations in order to support the informed identification of a design possibility.</i> 3-4 Pages Investigation 1-2 Pages Specification <i>The specification should be informed by the questions raised by research and investigation findings. Specification points should be technical and measurable to allow for realistic testing and evaluation. An effective specification is organised logically and could be achieved by using subheadings such as:</i> ● Purpose/function ● Form ● User requirements ● Performance requirements (considering relevant standards) ● Material and component requirements ● Scale of manufacture and cost NEA: Part 1.1 Identification and investigation of a design possibility (AO1 1a 9 marks) 2. Investigation of needs and research (AO1 1a 15 marks)	To be able to carry out and evidence primary research activities such as an interview, a group survey, the observation of a task being carried out, or an environment analysis. To be able to write a clear and concise design brief that refers to the needs and wants of the identified user/client or user group. To be able to write a list of specification criteria that are realistic in their expectation and justified. To be able to produce 3-4 quality design ideas that are visibly different and meet the needs or wants of the user/client or user group and solve the identified problem. To be able to show considerations of budget, aesthetics, and cultural and sustainability issues, through written annotation. To be able to show exploration of materials, components, processes, and techniques through annotation. To be able to review all of the design ideas that have been produced. To be able to conduct additional research which supports the refinement of the chosen initial idea towards a final design suitable for prototyping. To be able to make refinements which support an improvement against the specification. To be able to communicate how they are developing their design idea towards a final design, through analysing their options and evaluating their choices as an ongoing activity. To be able to present a “final design” within the evidence for development.	Weekly homework Classwork Marked Peer and self-assessment End of project assessment

to products and materials pg. 41-42 8.2 Characteristics, application, advantages, and disadvantages of quality monitoring systems pg. 66-68 8.3 Characteristics, processes, application, advantages and disadvantages of modern manufacturing methods and systems pg. 86 (a) Production scheduling and logistics pg. 86 (b) Robotics in production pg.105-108 (c) Materials handling systems pg.103-105 11.4 Implications of standards pg. 8, 68-69	3. Specification (AO1 1b 9 marks) Specification 4 Complete and detailed design ideas linked to specification and Design Brief- Each Design will include Development. 2 fully completed design idea/development to be completed per week. <i>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.</i> Present design ideas– demonstrate an ability to solve a design problem. <i>Use aesthetic features – Incorporate aesthetic understanding into features of designs</i> 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 The initial design ideas will contain a ideas that show different approaches to the design possibility and solving the design problems it presents. Designs should be annotated with design decisions justified. They should also explain details of design thinking and offer thoughts on design proposals. Ideas should demonstrate interaction with client/end user and designer,	To be able to develop a final design sufficient in detail and consideration so that another person with D&T knowledge such as can interpret the intentions for making. To be able to apply a range of different techniques throughout their design and development work. To be able to choose appropriate techniques at different stages to demonstrate their understanding of how and when to use different communication techniques in the context of a D&T project. To be able to communicate design ideas clearly and effectively using written techniques. To be able to analyse the chosen developed design idea against the list of specification criteria. To be able to demonstrate consideration for the materials, processes and techniques that would be used to make the prototype. To be able to seek authentic feedback from the user/client or user group identified for their project. To be able to conclusively communicate how they intend to manufacture the prototype. To be able to make and evidence decisions in relation to tools, equipment, and techniques and show their application when making the prototype. To be able to evidence their ability to carry out practical activity using safe working practices that account for both them and for others. To be able to include photographic and/or video evidence sufficient to show that the prototype they have made Functions as intended (or does not), meets the needs of the user/client (or does not), solves the identified problem (or does not) and meets the full list of specification criteria (or attempted to).	
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11.2 Modelling the costing of projects pg. 86. 12.1 Strategies, techniques, and approaches to explore, create and evaluate design ideas [not in book] 11.1 Information Handling, modelling, and forward planning pg.84 [parts not in book]	possibly using photographs, email, transcript or market research. <i>This section will be evidenced through any form of appropriate effective communication.</i> 2 Wks.-Feedback within 1 Week then Updates) 4 Complete and detailed design ideas linked to specification and Design Brief- Each Design will include Development. Use research – draw from information and understanding gained from research to inform ongoing developmental changes. Use an iterative approach – employ a process of 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 Use research – draw from information and understanding gained from research to inform ongoing developmental changes. Use an iterative approach – employ a process of planning, experimenting, designing, modelling, testing, and reviewing, including use of input from client/end user to inform decision making, make improvements and refine design at each stage of development. NEA: Part 2: Designing a prototype.	To be able to test their final prototype with the user/client or user group. To be able to analyse how their prototype performed against the measurable specification points. To be able to critically judge if their prototype met, partially met, or did not meet each specification point. To be able to carry out an LCA based on their final made prototype.	
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	Design ideas (AO2 9 marks) NEA: Part 2: Designing a prototype. Development of design ideas Development of design ideas (AO2 9 marks) NEA: Part 2: Designing a prototype. Final design solution (AO1 3 marks, AO2 6 marks) Part 3: Making a final prototype (Modelling) Part 4: Evaluating own design and prototype.		
Unit 5 Term 3 Exam	Topic 9 Designing for maintenance and the cleaner environment. 12.3 Product life cycle pg. 138 Topic 10.1 Current Legislation [NEW- Sales of Goods act] 11.3 Intellectual property rights [NEW] 12.2 Project management [NEW] Revision- Recap Year 1 topics Revision/Past Paper Questions. Revision Reverse engineer exam questions based upon topics		