



**'Bridging the Gap'**

**A LEVEL DESIGN & TECHNOLOGY**



**CHALLENGE • NURTURE • INSPIRE**





## Preparation for A Level Design and Technology OCR specification focusing on product design H406

Product design is a large field where any product in the world could be classified under. Therefore, students are encouraged to have a broad mind and not to become fixated on one particular area. The A-level course is designed to allow students to be able to apply a range of engineering, industrial design, architectural, fashion, and/or any design-based course at University. The course also lays a strong foundation for those who would be interested in an apprenticeship approach post A-level and those who would like to go straight into employment.

The Design and Technology course at Taunton school is enquiry based, innovative and forward thinking. The aim of the course is to provide students with a strong foundational knowledge of a variety of different materials. The knowledge they gain about these materials will allow them to explore a range of different context-based projects in year 12. The aim of these projects is to teach the students through active learning the essential properties both physical and mechanical, characteristics, environmental impact, and social and moral considerations when choosing the most appropriate material to carry out the primary function of the design solution from the set context challenge.

The students will be exposed to different manufacturing methods; they will learn the benefits and limitations of manufacturing methods associated with a particular material. This could be volume of production, speed of production, cost of production, initial setup costs, impact on the social community, impact on the ecological environment, and any other relevant design-based factor.

The course has a holistic approach when working through the design challenges; the students develop the skill to link all the different factors that need to be considered when looking at a solution to a problem. These factors include the appropriate choice of material, they include the appropriate manufacturing method for the choice of material and potentially the geographical location of manufacture; they consider the impact both socially, morally, and ecologically on the environment.

Design and Technology is not a linear process. The beauty of the course is exposing students to very modern and important considerations when looking at the world we live in today. The course has critical thinking; it develops problem-solving skills within a creative environment, and crucially the students are encouraged in the Department to take advantage of the world-class facilities at Taunton school to produce three-day prototypes of their potential solutions to engage in rigorous testing in order to gather useful feedback that can be applied to their initial prototype and changes can be made through a series of iterations in order to reach an appropriate final outcome.

### Aims and learning outcomes

OCR's A-level in Design and Technology will encourage learners to:

- be open to taking design risks, showing innovation and enterprise whilst considering their role as responsible designers and citizens
- develop intellectual curiosity about the design and manufacture of products and systems, and their impact on daily life and the wider world
- work collaboratively to develop and refine their ideas, responding to feedback from users, peers and expert practitioners
- gain an insight into the creative, engineering and/or manufacturing industries
- develop the capacity to think creatively, innovatively and critically through focused research and the exploration of design opportunities arising from the needs, wants and values of users and clients
- develop an experienced understanding of iterative design processes that is relevant to industry practice



- be able to make informed design decisions through an in-depth understanding of the management and development of taking a design through to a prototype/product
- be able to create and analyse a design concept and use a range of skills and knowledge from other subject areas, including mathematics and science, to inform decisions in design and the application or development of technology
- be able to work safely and skilfully to produce high-quality prototypes/products
- have a critical understanding of the wider influences on Design and Technology, including cultural, economic, environmental, historical and social factors
- develop knowledge and experience of real world contexts for design and technological activity products to meet multiple needs and develop a strong core knowledge and understanding of principles in design and technology enabling them to make informed decisions in broader contexts
- become independent and critical thinkers who can adapt their technical knowledge and understanding to different design situations
- develop an in-depth knowledge and understanding of materials, components and processes associated with the creation of products that can be tested and evaluated in use

## Requirements

Develop the ability to draw on and apply a range of skills and knowledge from other subject areas, including the use of mathematics and science for analysis and informing decisions in design development and use key Design and Technology terminology to communicate effectively in future education and employment.

Become empathetic and successful designers, who not only consider global and local change, but also the wider social implications of Design and Technology.

## Course Overview

Content Overview	Assessment Overview	
<p>This paper is set out through four sets of questions that predominantly cover technical principles within each endorsed title. Learners will be required to:</p> <ul style="list-style-type: none"> <li>• analyse existing products</li> <li>• demonstrate applied mathematical skills</li> <li>• demonstrate their technical knowledge of materials, product functionality, manufacturing processes and techniques</li> <li>• demonstrate their understanding of wider social, moral and environmental issues that impact on the design and manufacturing industries</li> </ul>	<p><b>Principles of ... (01)</b> 80 marks 1 hour 30 minutes Written paper</p>	<p><b>26.7%</b> of total A Level</p>
<p>This component has a series of longer answer questions that require learners to demonstrate their problem solving and critical evaluation skills. Learners will be required to:</p> <ul style="list-style-type: none"> <li>• apply their knowledge, understanding and skills of designing and manufacturing prototypes and products</li> <li>• demonstrate their higher thinking skills to solve problems and evaluate situations and suitability of design solutions</li> </ul>	<p><b>Problem Solving in ... (02)</b> 70 marks 1 hour 45 minutes Written paper</p>	<p><b>23.3%</b> of total A Level</p>
<p>The 'Iterative Design Project' requires learners to undertake a substantial design, make and evaluate project centred on the iterative processes of explore, create and evaluate. Learners identify a design opportunity or problem from a context of their own choice, and create a portfolio of evidence in real time through the project to demonstrate their competence</p>	<p><b>Iterative Design Project ... (03,04)</b> 100 marks Approx. 65 hours Non-exam assessment</p>	<p><b>50%</b> of total A Level</p>



At the centre of any iterative process is the need to develop critical-creative thinking skills to manage and organise opportunities that are identified. This learning will equip learners with life-long skills of problem spotting and problem solving and enable them to apply their learning to different social, moral and commercial contexts.

The enquiry nature of this specification's content will encourage learners to make links between topics and to explore, create and evaluate a range of outcomes. It encourages a creative approach supported by subject knowledge in order to design and make prototypes that solve authentic, real-world problems and have real potential to become viable products.

The 'Iterative Design Project' is a substantial design, make and evaluate project that allows learners to reposition or develop further an existing product in relation to a given context. The experience of this will be supported by and support their learning for the 'Principles' written exam.

## Key Theory

The knowledge, understanding and skills that all learners must develop are underpinned by technical principles predominantly assessed in the written exam, and designing and making principles predominantly assessed in the non-exam assessment (NEA) although there is an expectation that learning builds a holistic understanding of the subject.

There is distinct content for the exam and non-exam assessment, but this is held together through nine topic areas that shape all components and give clarity, these are:

The indicative content for the exam and non-exam assessment, but is held together through nine topic areas that shape or components and give clarity, these are:

1. Identifying requirements
2. learning from existing products and practise
3. implications of wider issues
4. design thinking and communication
5. material considerations
6. technical considerations
7. manufacturing process and techniques
8. viability of design solutions
9. Health and safety

Design and Technology requires learners to apply mathematical skills and understand related science. This reflects the importance of Design and Technology as a pivotal STEM subject.

	Week	Teacher 1	Teacher 2	
Winter	1	Flat Pack	UCD	
	2	Flat Pack	UCD	
	3	Flat Pack	UCD	
	4	Flat Pack	UCD	
	5	Flat Pack	UCD	
	6	Flat Pack	UCD	
	Half Term			
	7	Flat Pack	Flying Tiger	
	8	Flat Pack	Flying Tiger	
	9	Flat Pack	Flying Tiger	
	10	Flat Pack	Flying Tiger	
	11	Flat Pack	Flying Tiger	
12	Flat Pack	Flying Tiger		



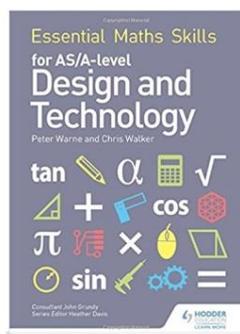
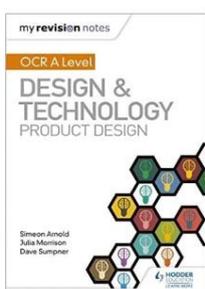
	Christmas		
Spring	13	Personal Protection	Principles
	14	Personal Protection	Principles
	15	Personal Protection	Principles
	16	Personal Protection	Principles
	17	Personal Protection	Principles
	18	Personal Protection	Principles
	Half term		
	19	If Makita Made a Coffee Machine	Problem Solving
	20	If Makita Made a Coffee Machine	Problem Solving
	21	If Makita Made a Coffee Machine	Problem Solving
	22	If Makita Made a Coffee Machine	Problem Solving
	23	If Makita Made a Coffee Machine	Problem Solving
	24	If Makita Made a Coffee Machine	Problem Solving
Easter			
Summer	25	NEA	Principles
	26	NEA	Principles
	27	NEA	Principles
	28	NEA	Principles
	29	NEA	Principles
	30	NEA	Principles
	31	NEA	Problem Solving
	32	NEA	Problem Solving
	33	NEA	Problem Solving
	34	NEA	Problem Solving
	35	NEA	Problem Solving
	36	NEA	Problem Solving

Typical Structure for Units of Work

Note; Y13 focuses on the NEA, and exam practice.  
NEA = Iterative Design Project.

**Textbook**

Students will be allocated the appropriate OCR designing technology textbook and they will also be supplied with essential math skills for A-level reference book. The Department would advise:





## Design Skill Practice

Students are encouraged to purchase a sketchbook and practise the following prior to starting the A-level course:

- quick free hand 2d sketching
- sketching in pen
- sketching in blue or red coloured pencil
- two point and three-point perspective drawing
- sketching cylinders and spheres
- when doing with coloured pencils

## CAD

Computer aided design (CAD) is a vital part of the design process. Taunton school users Autodesk Fusion 360. This software is available to download for free for educational and non-commercial use. New students who hasn't used this software before or encouraged to download it and work through some basic tutorials that can be accessed via Autodesk or YouTube.

Additionally, students are introduced to techsoft 2D design to enable them 2 transfer drawings from the documents to CNC machinery.

Being aware of the difference between a dxf file, and STL file is important but not imperative as students will learn the difference between the two B

<https://www.autodesk.co.uk>

## Preparation Design Project for the Summer

Work through the iterative design process to solve one of the sustainable development goals set out by the UN. The core focus of this task is for you to show how you approach a design problem from prior learning.

Produce a portfolio that contains the following:

### Clean design focus

- Pre investigation of a design situation
- Identification of users and stakeholders
- Selection of primary users
- User environments
- Similar product analysis
- Related product analysis
- Any other relevant research
- Clear design brief with a design goal and parameters

### Clear iterative design pathway

- Range design sketching
- Idea selection
- Technical specifications
- Design iterations
- Range of modelling techniques to help with iterations
- Testing where possible
- Feedback throughout the process



- Final design proposal – justifying choice of key components, and against the technical specification

Ensure you include:

- A variety of design drawing techniques
- Different modelling methods
- A clear design solution

Throughout the process; specifications, material choices and other design factors such as ergonomics and anthropometrics need to be included when they present themselves.

Focus on one of the UN Sustainable Development Goals below. And remember; be imitative, Creative, and Innovative.

