CURIOSITY COMPASSION COURAGE

Curriculum Overview 2022-23 KS5

Subject	Subject- DT KS5		
Vision statement:	At Landau Forte our curriculum exists to ensure all students regardless of background and ability have the opportunity to unlock their potential. We are committed to students being challenged from their previous key stage learning experiences. Our broad and balanced curriculum is ambitious, coherently planned and sequenced, and will provide the platform for preparing students with the foundations for examination success. Our Curriculum Intent has been informed by a wide variety of researchers and is steeped in evidence-based research. Christine Counsell summarises the aspiration of our curriculum to empower all learners creating a pathway to success in university, their career and life: *'A curriculum exists to change the pupil, to give the pupil new power. One decisive test for a curriculum is whether it enables even lower attaining or disadvantaged pupils to clamber into the discourse and practices of educated people, so that they gain powers of the powerful.'* As well as excellent academic success we aim to ensure our students leave us as polite and well-rounded young adults. Our new core values of Compassion, Courage and Curiosity are currently being embedded throughout our curriculum offer to ensure we continue to meet our social, emotional, spiritual, and moral obligations.		
Curriculum intent:	In line with the Academy's vision to enhance students' understanding of the world by ensuring an educational journey guided with care and compassion the Design Technology department at Landau Forte Academy QEMS aim to deliver a curriculum that not only develops students' theoretical knowledge, design concepts and practical skills of the subject but inspires them to succeed far beyond their education at the academy. The Design Technology curriculum aims to be; o Challenging for all o Ambitious o Coherent both in planning and sequence o Adapted successfully to suit all needs and abilities o Broad - covering a range of specialisms and subject disciplines within the DT curriculum area In delivering a knowledge and practical skill-based curriculum, students will be able to not only achieve the best they can academically but would be able to apply the theoretical knowledge into their practical outcomes and make seamless links and connections between them. Our course offers at KS4 and 5 ensure there is a wide range of options available to all learners to suit their needs and interests within the DT specialisms- in short enabling all our learners to unlock their potential within our subject area. In summary the Design Technology curriculum is developed and tailored for each specific year group considering the demographic of our students. The intention of which is to allow students to be challenged in both a theoretical context around our subject and in a practical setting based around the real-world situations. Our school values are at the heart of the planning and delivery of our curriculum – Curiosity, Compassion, and courage.		

Threshold Concepts (TCs):	<u>Threshold Concepts (Design Technology – following Iterative design process)</u> BTEC Engineering L3/ A Level Product Design Threshold Concepts TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge and understanding of materials, components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.
KS2 National Curriculum summary:	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to: • Design: • use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • Make: • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities • Evaluate: • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world • Technical Knowledge:

	• apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products					
Learner skills:	Critical thinking 	Organisation 	Collaboration 	Adaptability 	Oracy 	Self-quizzing 
Year 13 Engineering Certificate	Year 13 Term 1 Unit 10, Unit 3	Year 13 Term 2 Unit 3, Unit 10	Year 13 Term 3 Unit 3 Unit 10	Year 13 Term 4 Unit 3 Unit 10	Year 13 Term 5 Unit 3	Year 13 Term 6
The Big Question	Unit 3: Learning aim A: Design triggers, challenges, constraints and opportunities, and materials and processes Unit 10: Learning aim A: Develop a three dimensional computer aided model of an engineering product that can be used as part of other	Unit 3: Learning aim B: Interpreting a brief into operational requirements and analysing existing products Unit 10: Learning aim B: Develop two-dimensional detailed computer aided drawings of engineering product that can be used as apart of	Unit 3: Topic C: Using an iterative process to design ideas and develop a modified product proposal Unit 10: Learning aim C: Develop a three dimensional computer model for a thin walled product and fabricated product that can be used as	Unit 3: Topic C: Using an iterative process to design ideas and develop a modified product proposal Unit 10: Learning aim C: Develop a three dimensional computer model for a thin walled product and fabricated product that can be used as part of other engineering processes	Learning aim D: Technical justification and validation of the design solution	N/A

	engineering processes.	other engineering processes	part of other engineering processes	Learning aim D: Technical justification and validation of the design solution		
Big picture questions:	Unit 3: What are design triggers and challenges? What are the constraints around system level and equipment level? How do different material properties affect production? What is a mechanical power transmission? How are different manufacturing processes used? Unit 10: What is solid works and how is it used in CAD? How do we use solid works as a design tool?	Unit 3: How do we design to meet customer need? What are the regulations and constrains around design? What is market analysis and what factors affect the marketing of products? How do we analyse a products performance? What are the environmental factors around production? Unit 10: How do we use hand drawing to influence a design outcome? What are hand drawing methods?	Unit 3: What is the iterative design process? How do we communicate an idea or design? What ways can we draw designs? What information needs to be presented along side ideas? Unit 10:What is a thin walled design product? How can we design in CAD to produce a thin walled design?	Unit 3: What is the iterative design process? How do we communicate an idea or design? What ways can we draw designs? What information needs to be presented along side ideas? Unit 10: What is a thin walled design product? How can we design in CAD to produce a thin walled design? Unit 3: What are statistical methods and measurements in deisgn? How do we validate designs?	Unit 3: What are statistical methods and measurements in deisgn? How do we validate designs?	

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Content (Linked to TCs):	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge and understanding of materials,	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge and understanding of materials, components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge and understanding of materials,	

	components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.	and understanding of materials, components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.	and understanding of materials, components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.	TC1 – Contextual relevance: Critical understanding of the real world & wider influences of Design Technology including SMES, develop intellectual curiosity about design & manufacturing systems/products & their impact. TC2 - Research, Investigation & analysis: Create and analyse a design concept using range of skills including science, maths, to inform decisions within design. TC3 – Creativity & Design development: take design risks, show innovation whilst considering role as responsible designer. TC4 – Testing & Modelling: develop in depth knowledge and understanding of materials, components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on	components and processes. TC5 – Modification, Recommendations & evaluation: Work collaboratively to develop and refine ideas based on feedback from users, peers & experts.	[redacted]

				feedback from users, peers & experts.		
Key vocabulary:	Unit 3: Design triggers Commercial decisions/ mass/ batch/ one off production scales/ design challenges/ power sources and integration of component parts/ factors and limitations/ mechanical, physical, thermal and electrical or magnetic properties/ bio materials, smart alloys and nano-engineered/ surface treatments/ coatings/ motion and movement/ engineering systems Unit 10: CAD/ CAM/ Solidworks/ planning	Unit 3: Customer requirements/ meeting customer needs/ specification/ copy right and intellectual rights/ trademarks/ regulatory factors and compliance/ environmental factors and considerations/ Unique selling points/ built in obsolescence Unit 10: CAD/ CAM/ Solidworks/ planning scales and layout/ drawing standards and British standards/ Line standards/ sectional views/ technical solution/	Unit 3: 2D drawing methods- orthographic/ graphical design/ secondary research/ evaluate/ context/ brief/ technical criteria/ design solution/ iterative design cycle Unit 10: CAD/ CAM/ Solidworks/ planning scales and layout/ drawing standards and British standards/ Line standards/ sectional views/ technical solution/	Unit 3: 2D drawing methods- orthographic/ graphical design/ secondary research/ evaluate/ context/ brief/ technical criteria/ design solution/ iterative design cycle Unit 10: CAD/ CAM/ Solidworks/ planning scales and layout/ drawing standards and British standards/ Line standards/ sectional views/ technical solution/thin walled Unit 3: exam/ revision/ preparation/ statistical measurements/ discreet and continuous data/ collect data/ analyse data/ evaluate data/ frequency distribution curves/ mean, mode and median, and standard deviation	Unit 3: exam/ revision/ preparation/ statistical measurements/ discreet and continuous data/ collect data/ analyse data/ evaluate data/ frequency distribution curves/ mean, mode and median, and standard deviation	[redacted]

	scales and layout/ drawing standards and British standards/ Line standards/ sectional views/ technical solution/					
Assessment:	Unit 3: Yr13 PPE - Knowledge based assessment on; Forces, mechanisms, structures & materials and their properties Unit 10: Assignment A lego car Unit 2 C: resubmission from year 12.	Unit 10:Assignment B Orthographic drawings.	Unit 3: Yr 13 PPE - Past paper (3hrs) - Activity 1,2 & 3 Unit 10: Assignment C- 3D CAD	Unit 3: Yr 13 PPE - Past paper (3hrs) - Activity 4 Unit 10: Resubmission of any outstanding assignments. Unit 3 final exam Part A/ B	Unit 3 final exam Part A/ B	
Key/Historical misconceptions in this unit:						

Sequencing:	We have chosen to sequence the year 13 Engineering curriculum like this because it follows the specification and running both units parallel means they get both content over a longer period of time and allows for full preparation for the Unit 3 exam as well as time to complete assignments for unit 10.					
National Curriculum plus and values:	In addition to teaching the statutory elements of the national curriculum, we also include some elements required at KS4 to ensure a solid foundation is built at KS3 journey. Courage, Curiosity & Compassion is embedded and cross referenced through all lessons where best fits. The idea of building vocational and careers links through language of aspiration e.g., calling our students chefs or designers and encouraging those wider real-world links to the subject we teach. Also, through linking the curriculum back to careers and real-world experiences in industry e.g., legislation, machinery, equipment, how small production methods can be upscaled to mass production methods etc.					
Year 12 A Level Product Design	Year 12 Term 1	Year 12 Term 2	Year 12 Term 3	Year 12 Term 4	Year 12 Term 5	Year 12 Term 6
The Big Question	How do we choose materials & their application? Technical principles 1.1-1.5	How do we choose materials & their application? Technical principles 1.1 -1.5	What are design methods and their processes? Designing and making principles 1.6-1.10	What are design methods and their processes? Designing and making principles 1.11-1.13	How do we use critical analysis & evaluation? Designing and making principles 2.1-2.4	How do we use critical analysis & evaluation? Designing and making principles 2.5-2.8 NEA
Big picture questions:	What materials are available to us? 1.1 How do we know materials are suitable? 1.2	What is meant by forming? 1.4 How can finishes enhance performance? 1.5	What are modern industrial scales of practice? 1.6 How has the digital age changed designing	How do designers & manufacturers consider sustainability? 1.11 What is feasibility? 1.12 What is enterprise? 1.13	What design strategies can we use? 2.1 How has design been influenced by others? 2.2	How do we use critical analysis? 2.5 What tools, equipment & processes do we

	How can we enhance materials to perform better? 1.3		manufacturing industry? 1.7 What are the requirements for product design & development? 1.8 What are safe working practices? 1.9 How do we protect our designs? 1.10		What factors affect change in design? 2.3 How do we use the design process to provide solutions? 2.4	need to consider? 2.6 How important is accuracy? 2.7 What is responsible design? 2.8 What are the design possibilities? (SECTION A) How do we produce a brief & specification? (SECTION B)
Content (Linked to TCs):	T4-Test and model - Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely.	T4-Test and model - Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely.	T3-Design- Develop realistic design proposals, using a range of designing strategies including Isometric/ orthographic and CAD to meet a stakeholder need, within a given context and solves a problem. Link to wider contexts such as environmental impact- Product life cycles	T1- Context – Demonstrate understanding that all design technology activity takes place within all contexts that influence design practice T2-Analysis- Exploration of design opportunities & user's needs, wants & values.	T1,T2,T3,T4 T5- Evaluate and modify- Explain and justify decisions made, linked back to the design, modelling and researching of a context to meet needs of a stake holder. Suggest modifications and changes to make a product or idea more fitting of the context and meet the needs of a stake holder.	T1- Context – Demonstrate understanding that all design technology activity takes place within all contexts that influence design practice T2-Analysis- Exploration of design opportunities & user's needs, wants & values.

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Key vocabulary:	Properties Characteristics Conductivity	Functionality Integration Components Seasoning Performance Fabrication Redistribution Wastage Addition	Anthropometrics Ergonomics Legislation Intellectual property	Sustainability Disassembly Feasibility Lean Manufacturing Prototype Entrepeneur Product life cycle	Iterative User Centred design Streamlining Movements Socio economic Ethical Fair trade Sustainable SCAMPER Specification Commercial	Critical analysis Standards Conformity Demographic Accredited Datum Tolerance Dimension Circular economy Carbon footprint
Assessment:	Retrieval Practice Knowledge checks Unit assessments Focused practical tasks	Retrieval Practice Knowledge checks Unit assessments Focused practical tasks	Retrieval Practice Knowledge checks Unit assessments Focused practical tasks	MOCK PPE Retrieval Practice Unit assessments Knowledge checks	Retrieval Practice Unit assessments Knowledge checks	PPE Retrieval Practice Unit assessments Knowledge checks
Key/Historical misconceptions in this unit:	Difference between physical & working properties.					
Sequencing:	We have chosen to sequence the Year 12 Design Technology curriculum like this because it mirrors guidance from gov website and that of the literature we use to support the course.					

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National Curriculum plus and values:	In addition to teaching the statutory elements of the national curriculum, we also include some elements required at KS4 to ensure a solid foundation is built early on in the KS3 journey. Courage, Curiosity & Compassion is embedded and cross referenced through all lessons where best fits. The idea of building vocational and careers links through language of aspiration e.g., calling our students chefs or designers and encouraging those wider real-world links to the subject we teach. Also, through linking the curriculum back to careers and real-world experiences in industry e.g., machinery, equipment, how small production methods can be upscaled to mass production methods etc.					
Year 13 A Level Product Design	Year 13 Term 1	Year 13 Term 2	Year 13 Term 3	Year 13 Term 4	Year 13 Term 5	Year 13 Term 6
The Big Question	2.1 What are design methods and their processes? 2.3 How does new technology affect product design? 2.6 How do we select the most appropriate manufacturing processes to realise design proposals? 2.7 How do we achieve accuracy in design & manufacture? NEA	2.2 How have historical styles & movements influenced designers? 2.3 How have socio economic influences helped shape product design and manufacture 2.4 How can we demonstrate the development of a prototype from design proposals? NEA	2.5 How can we make our design commercially viable using critical evaluation? 2.8 How can designers be more responsible? 2.9 What does it mean to design for manufacture and project management? 2.10 How important are national & international standards within product design? NEA	4.4 Maths How does maths feature in product design? NEA Completion Submit NEA	NEA final submission Exam prep Revision	N/A

Big picture questions:	How do we plan & monitor a project? 2.9 What is the importance of National & International standards in product design? 2.10 How do we manufacture our solution? How do we develop our NEA solution? (SECTION C)	How do we develop our NEA solution? (SECTION C) How do we manufacture our NEA solution? (SECTION D)	How do we manufacture our NEA solution? (SECTION D)	How do we manufacture our NEA solution? (SECTION D)		N/A
Content (Linked to TCs):	T1, T2, T3, T4-Test and model -Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely. T5	T1, T2, T3, T4-Test and model -Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely. T5	T1, T2, T3, T4-Test and model -Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely. T5	T1, T2, T3, T4-Test and model -Develop a broad knowledge of materials and their properties including source & origin. Use a range of practical skills, materials, tools, and equipment. Use a range of testing methods to see if a model is fit for purpose both accurately & safely. T5		N/A

Key vocabulary:	Critical path analysis Scrum Quality control Quality assurance	Revisit key vocabulary from design process	Revisit key vocabulary from design process	Revisit key vocabulary from design process	Revisit key terms & vocabulary	N/A
Assessment:	Retrieval Practice Knowledge checks Unit assessments- KLT Focused practical tasks	Retrieval Practice Knowledge checks Unit assessments - KLT Focused practical tasks	Retrieval Practice Knowledge checks Unit assessments - KLT Focused practical tasks	MOCK PPE Retrieval Practice Unit assessments - KLT Knowledge checks NEA completion 50% of final A Level grade	Retrieval Practice Unit assessments Knowledge checks A Level end of course Exam	
Key/Historical misconceptions in this unit:						
Sequencing:	We have chosen to sequence the Year 13 Design Technology curriculum like this because it mirrors guidance from gov website and that of the literature we use to support the course.					
National Curriculum plus and values:	In addition to teaching the statutory elements of the national curriculum, we also include some elements required at KS4 to ensure a solid foundation is built early on in the KS3 journey. Courage, Curiosity & Compassion is embedded and cross referenced through all lessons where best fits. The idea of building vocational and careers links through language of aspiration e.g., calling our students chefs or designers and encouraging those wider real-world links to the subject we teach. Also, through linking the curriculum back to careers and real-world experiences in industry e.g., machinery, equipment, how small production methods can be upscaled to mass production methods etc.					