



Year 11 Engineering curriculum – 2024-2025

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	<p>Unit 2: Designing Engineering Products Controlled assessment: 10 hours 20% of qualification</p> <p>The newly released annual client brief develops the product requirements further, requiring improvements to be made to the project manufactured in Unit 1.</p> <p>Students understand the new client brief requirements, then design a functioning product.</p> <p>Once they have completed the project solution, students complete a self evaluation and project evaluation to ensure the client brief requirements were met.</p>		<p>Unit 3: Solving engineering problems</p> <p>This unit introduces learners to how engineering design is impacted by a range of external considerations such as the properties of materials, both traditional and smart developing materials, as well as methods of manufacturing in both the traditional and new and emerging technologies. It also gives the learner the opportunity to explore how engineering achievements have had an impact on modern day life at home, work and in society in general.</p> <p>Finally, the unit allows learners to develop understanding and skills to assist them in the solving of engineering problems.</p>			



Knowledge & Understanding (National Curriculum)

Skills are across the whole year.

Students will know and understand how to:

Component 2

Understanding function and meeting requirements In this section, learners will gain knowledge of how engineered products function and meet the needs and requirements of given situations, briefs and specifications. Focus will be across a range of engineering areas:

- 2.1.1 primary features of the given engineered product
- 2.1.2 identifying features of other engineered products
- 2.1.3 function of the proposed solution.

Proposing Design Solutions In this section, learners will gain knowledge, understanding and skills in producing specifications based on a brief and their own investigative work. Learners will develop the following skills in producing and presenting creative ideas and solutions:

- 2.2.1 generating a range of engineered solutions
- 2.2.2 developing ideas through to a conclusion
- 2.2.3 communicating design ideas.

Communicating an engineered design solution In this section, learners will develop knowledge, understanding and skills in using techniques, including traditional and computer aided design (CAD) based processes, to present solutions in an appropriate and meaningful way in relation to:

- 2.3.1 producing an engineering specification
- 2.3.2 drawing an engineering design solution that adheres to recognised standards.

Solving applied engineering problems In this section, learners will develop knowledge, understanding and skills in:

- 2.4.1 using mathematical techniques for solving applied engineering problems
- 2.4.2 justifying suitable materials for use in the final engineered solution
- 2.4.3 justifying suitable processes for manufacturing the final engineered solution.

Component 3

Understanding the effects of engineering achievements In this section learners will gain knowledge and understanding of engineering developments relevant to:

- 3.1.1 describing engineering developments
- 3.1.2 explaining the effects of engineering achievements
- 3.1.3 explaining how environmental issues affect engineering applications.



	<p>Understanding properties of engineering materials In this section, learners will develop knowledge and understanding of the properties of materials and how they react in different situations: 3.2.1 understanding materials, their properties, and their selections for specific purposes 3.2.2 describing properties required of materials for engineering products 3.2.3 explaining how materials are tested for properties.</p> <p>Understanding methods of preparation, forming, joining and finishing of engineering materials In this section, learners will gain knowledge, understanding and skills in preparing, using and finishing materials. Learners will also gain knowledge and understanding in engineering processes and machining, in relation to: .3.1 describing engineering processes 3.3.2 describing applications of engineering processes 3.3.3 safe working practices.</p> <p>Solving engineering problems In this section, learners will develop knowledge and understanding of: 3.4.1 using mathematical techniques for solving engineering problems 3.4.2 understanding and producing engineering drawings</p>	
Skills	<p>R <i>Develop</i> RESILIENCE</p>	<ul style="list-style-type: none"> ★ <i>Students develop the ability to overcome challenges and learn from failures in their development of product in unit 1</i> ★ <i>Students are encouraged to be reflective engineers with their designs.</i> ★ <i>Students are taught the principles of a growth mindset, emphasising that abilities can be developed through effort and learning, especially important with OnShape CAD work.</i>
	<p>A <i>Possess</i> AMBITION</p>	<ul style="list-style-type: none"> ★ <i>Students are inspired to set high goals, take initiative, and pursue their aspirations with determination and passion.</i>



		<ul style="list-style-type: none"> ★ Students are taught practical applications of engineering principles in the curriculum.
	<p>I Demonstrate INTEGRITY</p>	<ul style="list-style-type: none"> ★ Faculty members model integrity their own CAD work and model the importance on continued professional development. ★ Students foster an accountability for their own controlled assessments, theory work and revision for the external examination.
	<p>S Embed Self-Discovery</p>	<ul style="list-style-type: none"> ★ Students are inspired to set high goals, knowing the overall tracking sheets for their achievements with Unit & 2 and marks required for unit 3. ★ Students are taught practical applications of engineering principles in the curriculum.
	<p>E Display EMPATHY</p>	<ul style="list-style-type: none"> ★ Faculty members model integrity in their interactions with students and colleagues. ★ Students foster accountability for their own controlled assessments, theory work and practical pieces.
Curriculum Links	The unit is linked to the engineering product produced in Unit 1 of the qualification. It will require the learner to work to a given brief to adapt an existing component, element or part of the engineering outcome that they produced for Unit 1.	Unit 3's assessment will require learners to draw on knowledge and understanding from Units 1 and 2 whilst applying it to different contexts and scenarios.



Assessment	Unit 2: Designing Engineering Products Formal Internal Controlled assessment, externally moderated: 20% of qualification	Unit 3: Solving Engineering Problems Externally assessment formal examination. 1 hour 30 min 40% of the course.	
Aspirations & Careers	<ul style="list-style-type: none"> • Students are taught to the top, allowing all to achieve a Distinction in all units. • Throughout all unit discussions are had on career opportunities Marine engineer, Industrial engineer, Mechanical engineer, Computer engineer, Chemical engineer, Biomedical engineer, Petroleum engineer, Civil engineer, Environmental engineer, Electrical engineer, Nuclear engineer, Aeronautical engineer, Materials engineer & Software engineer • University courses as well as apprenticeships options are discussed to ensure that everyone knows available opportunities. 		