

INTENT:



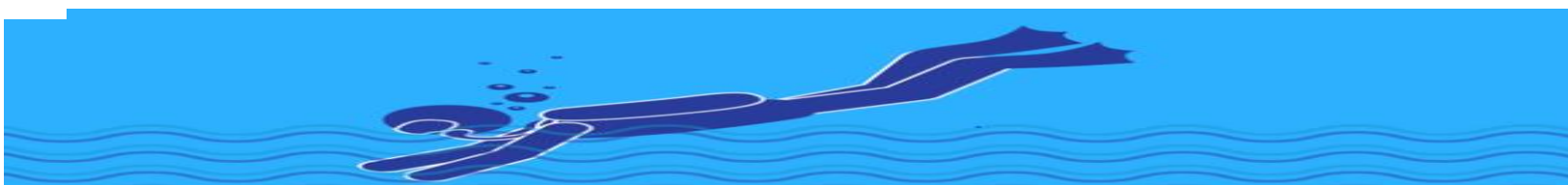
“The way you learn anything is that something fails, and you figure out how not to have it fail again.”

Robert Arrighi

Studying Engineering at The King's allows students to understand the mechanical and physical environments of their surroundings. It helps students to foster a sense of inquisitiveness, appreciating how problems are solved and in what environment these solutions can continue to be developed so they remain in tune with our ever changing world.

As a department, we aim to provide our students with the necessary theoretical knowledge, understanding and practical skills to manufacture solutions to realistic world problems and scenarios. The strong emphasis on problem solving is linked intrinsically with creativity where students are encouraged to push boundaries, challenge the status quo and continually think 'outside of the box'.

Sharing our passion and deep subject knowledge equips our students with high quality learning experiences which will inspire, ensure outstanding progress and provide them with a range of skills to enable them to be effective participators in society. They will study a wide range of topics and have learning experiences which will widen their understanding of the mechanical and physical world. Students will be challenged by difficult tasks and be asked to respond to a range of demanding activities which will push students to value creativity and harness a deep knowledge of materials, properties and manufacturing processes.



****Please click on the icons to access our online portal where you can learn more about each topic****

Half term points

AUTUMN 1

AUTUMN 2

SPRING 1

SPRING 2

SUMMER 1

SUMMER 2

2 Delivery of engineering processes safely as a team.

- Engineering processes and human factors.
- 2D CAD drawings.
- Using engineering processes and working as a team.

A. Examine common engineering processes to create products or deliver services safely and effectively as a team.

B. Develop two dimensional computer aided drawings that can be used in engineering processes.

C. Carry out engineering processes safely to manufacture a product or to deliver as service effectively as a team.

4 Applied commercial and quality principles in engineering.

- Business activities and trade considerations.
- Activity based costing
- Quality systems and value management

A. Examine business function and trade considerations that help engineering organisations thrive.

B. Explore activity based costing as a method to control costs and to determine if an engineering product or service is profitable.

C. Explore how engineering organisations use quality systems and value management to create value.

5 A specialist engineering project.

- Investigating an engineering project.
- Implement project-management processes to develop a solution for an engineering project
- Development and testing of a project solution.

A. Investigate an engineering project in a relevant specialist area.

B. Develop project management processes and a design solution for the specialist engineering project as undertaken in industry.

C. Undertake the solution for a specialist engineering project and present the solution as undertaken in industry.

10 Computer aided design in engineering.

- 3D models.
- 2D CAD drawings.
- 3D CAD models for fabricated and thin walled products.

A. Develop a three dimensional computer-aided model of an engineered product that can be used as part of other engineering processes.

B. Develop two dimensional (2D) computer - aided drawings that can be used in engineering processes.

C. Develop a three dimensional computer aided model for a thin walled product and as fabricated product that can be used as a part of other engineering processes.

Lead into next years units. Learning background, skills and knowledge.

9 Work experience in the engineering sector

- Preparing for a work experience placement.
- Participating in work experience and reflecting on own development.

A: Examine the benefits of work experience in engineering for own learning and development

B: Develop a work experience plan to support own learning and development

C: Carry out work experience tasks to meet set objectives

D: Reflect on how work experience influences own personal and professional development

Long and thin learning and assessment approach. 3 hours a fortnight each.

Unit 1: Engineering principles.

Unit 3: Engineering design and Manufacture

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Half term points					
AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
<p>40 Computer aided manufacturing and planning.</p> <ul style="list-style-type: none">• CAM systems in Industry• Prototyping a component• Preparing for manufacture <p>A: Examine the benefits, technology and applications of computer-aided manufacturing systems that improve the operation.</p> <p>B: Develop a virtual component on a computer aided manufacturing system that simulates its manufacture.</p> <p>C: Investigate planning documentation used to optimise the workflow and initiate manufacture in the operation.</p> <p>24 Maintenance of mechanical systems.</p> <ul style="list-style-type: none">• CAM Systems in Industry• Prototyping a component• Preparing for manufacture <p>A: Examine the benefits, technology and applications of computer-aided manufacturing systems that improve the operation</p> <p>B: Develop a virtual component on a computer aided manufacturing system that simulates its manufacture</p> <p>C: Investigate planning documentation used to optimise the workflow and initiate manufacture in the operation</p>		<p>22 Electronic printed circuit board design and manufacture.</p> <ul style="list-style-type: none">• Printed circuit board technology and manufacture.• Schematic capture and simulation of electronic circuits• Development of a printed circuit board and reflection on own performance. <p>A: Examine the design and manufacture of printed circuit boards that are widely used in industry</p> <p>B: Explore how computer software is used for schematic capture and simulation of an electronic circuit</p> <p>C: Develop safely a printed circuit board to solve an engineering problem</p> <p>D: Review the development of the printed circuit board and reflect on own performance.</p>			
Long and thin learning and assessment approach. 3 hours a fortnight each.					
Unit 1: Engineering principles. Unit 3: Engineering design and Manufacture					