ASHLAWN SCHOOL

Key Stage 4 Curriculum Journey: Year 11 Engineering

The curriculum in Engineering equips learners with the knowledge to understand the processes of engineering including design, analysis, prototype development and evaluation, and the role that engineering plays in the world. The subject is designed to inspire students to be innovate, creative and apply their knowledge in a way which is transferable to, and draws on different real-life contexts such as design, mechanical and quality control engineering. Students are encouraged to move from theory to practice and to bring their ideas into reality by developing solutions to technical issues

THE YEAR 11 CURRICULUM JOURNEY

	HALF TERM 1	HALF TERM 2	HALF TERM 3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic and learning focus	Building Fusion 360 skills to develop enhanced Fusion models. Using and explaining 3rd angle orthographic drawings including symbols and tolerances. Modelling techniques and use of QFD as a process planning tool.		Manufacturing processes including applications of the different processes to different examples of products. Interpreting engineering drawings and sketching isometric views from orthographic drawings (and vice versa) Revision of key exam topics and past paper practice			
Foundational Knowledge Prior learning needed	• Freehand sketching and rendering techniques • Understanding information contained in a design specification.		• Key features of orthographic drawings. • Manufacturing techniques			
Core Knowledge and skills	• Use Fusion 360 to draw complex combinations of shapes and join them together. • Produce 3rd angle orthographic drawings using CAD software and manually by hand. •		• Understand how to draw an isometric drawing from an orthographic drawing. • Suggest advantages and disadvantages for a range of manufacturing techniques. • Revise key topic areas for R038 exam			
Developmental Knowledge and Skills	• Produce exploded and sectional views using Fusion 360. • Understand the full range of symbols that might be used in orthographic drawings.		• Be able to suggest which manufacturing techniques might be most suitable for a range of different products or components. • Be able to represent complex engineering drawings as isometric views and vice versa.			
Complex Knowledge	• Use Fusion 360 to produce animation and complex assemblies..		• Interpret complex orthographic drawings using a wide range of symbols and terminology.			

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Links with the National Curriculum	KS3/4 DT select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties use research and exploration, such as the study of different cultures, to identify and understand user needs identify and solve their own design problems and understand how to reformulate problems given to them develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	KS3/4 DT develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools use research and exploration, such as the study of different cultures, to identify and understand user needs identify and solve their own design problems and understand how to reformulate problems given to them develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	
Literacy (including reading)	• Reading accounts of the manufacturing processes used for a wide range of products, summarising and identifying the key points. • Use of case studies on real engineering scenarios • Reading articles describing processes such as sand-casting and die casting. • Summarising and paraphrasing complex ideas into key points.	• Formulating questions and analysing responses to/from surveys and focus groups considering clarity of questions. • Use of articles and engineering case studies (such as the construction of bridges and the Iphone)	
Cultural Capital	• An understanding of how everyday products are designed and made and how engineering decisions impact our lives. • An understanding of the importance of risk assessment in a range of scenarios.	• Applications of engineering principles to structures and inventions throughout history (for example the construction of the pyramids and ancient structures)	
Social, Moral, Spiritual and Cultural Development **Fundamental British Values**	• Discussion and teamwork with opportunity for lots of collaborative working. • Environmental impact of our manufacturing and design choices. The importance of careful use and selection of materials for minimal cost and environmental impact. The need to balance environmental impact against cost and economic factors. • An appreciation of the legal framework in which designers and companies are required to operate in including safe working and the development and testing of safe products. • Analysis of products, identifying strengths and weaknesses to ensure that the correct products are chosen for the appropriate tasks. • Mutual respect is fostered through collaborative working and sharing of ideas.		

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Assessment	• Assessment of R039 coursework Tasks 1-4 • Past paper based assessment of R038 content • Mock examination	• Past paper practice of R038 content.	