

ENGINEERING



Revision: Linked to all areas of the specification including R38, R39 & R40 – This includes research, Quizzing, review, revision and mock examinations of students to fully prepare for the written exam.



Formulae It ENGINEERING

Formulae It: This exam will draw on a range of STEM (Science, Technology, Engineering and Maths) skills



Research: Finding out what already exists and looking to better these ideas is an ideal starting point to explore

Design: Completing a range of 2D and 3D sketches, Technical drawings and CAD final designs is mirroring exactly what goes on within all areas of engineering.

Practical: Students will work with a hand of hand, automated and fixed machinery in the production of their final prototype model – this will include woods, metals and plastics.

EXAM

R38 – Written examination paper. *This unit can only be sat by students who have successfully completed and moderated their coursework)

R38 - EXAM REVISION

R40 ASSESSMENT (12 Hours)

YEAR 11



Research: What is engineering? and what skills are required to be a successful?

Design:

How do engineers come up with ideas? How are these developed and presented in industry? How do you know you have created the best idea?



Manufacture: Working from an idea of your own, manufacture timber frame, inset laser cut lid and soldering of components

Evaluation:

Did you achieve everything that was set out? Were there any set back? And so, how did you overcome these?



Research: Existing products, design trends and market pull. Explore materials and manufacturing techniques used in existing products

Materials / Make:

Producing a design portfolio of initial idea sketches, 2D and 3D Technical drawings (isometric and third angle orthographic) and CAD on Fusion and Sketch Up



R39 ASSESSMENT (12Hours)

ENGINEERING SKILLS

Introduction to the course – what is engineering? A speaker project to introduce you to the design process, manufacturing and key skills and knowledge

Evaluate:

Create a presentation linked to the new architectural building looking to justify all the key design decisions being made

Design:

Focus your idea on an engineering brief, developing a range of designs that meet the set criteria.



Design:

Practicing Isometric Projection and rendering skills. Orthographic projection (Floor Plans).

Technical Knowledge:

Exploring the structural engineering/ architect job roles, researching around a set design brief and analysing essential and desirable parts of the design specification.



By the end of Year 9 students will be able to:

Understand the key roles and responsibilities of an architect and look to use this as a starting point to model skills and qualities.

Use language of drafting

Draw 2D plans of construction designs

Safely and accurately model and prototype design ideas

Effectively communicate key concepts within design proposals

By the end of Year 8 students will be able to:

Relate learning to wider industry roles and responsibilities

Be able to communicate design ideas effectively

Be able to safely and accurately manufacture a finished engineered product

By the end of Year 7 students will be able to:

Be able to use Relate learning to wider industry roles and responsibilities

Be able to work with hand, CNC and automated tools safely and accurately

Be able to summarise the advantages and disadvantages of automation in the production of a range of products.

YEAR 10

EVALUATE

MAKE

DESIGN

TECHNICAL KNOWLEDGE

ARCHITECTURAL DESIGN PROJECT

KS4

Development: Use ACCESS FM as a framework for Analysing design ideas and providing feedback.



Make: Using a range of hand and fixed machinery manufacture desk tidy characters



Evaluate: Complete a review into the manufacturing process looking at ways of improving



YEAR 9

MAKE

EVALUATE

YEAR 9

ARCHITECTURAL DESIGN PROJECT

Development: Test ideas, looking to make improvements and develop the best final design



Design: Understand isometric drawing techniques and use this to communicate design ideas



Research: Explore a range of existing products, and re-design for intended users

Materials/ Components & Tools: Explore and research a range of engineering equipment, material properties and standard components



YEAR 8

DESIGN

TECHNICAL KNOWLEDGE

YEAR 8

DESK TIDY PROJECT

Materials: Working with acrylics and timber, cutting, shaping and finishing techniques.

Make: Manufacture a key ring by hand, using measuring and marking out, cutting and shaping and finishing skills



Evaluate: What makes a good keyring & How can you improve your skills?



Evaluate: Does your product work? How can you fix problems?

Evaluate: How has CAD / CAM helped you make a product? How can my manufacturing be improved?

Make: Generation of MDF and acrylic keyrings with hand and automated engineering techniques



Design: CAD What is computer aided design? Learn to use the basics of 2D software to design products- generation of acrylic components



Design: Designing considering making restrictions 2 key rings

Tools and Machinery: Exploring hand, automated and fixed machinery in the workshop – linking to functions and outcomes

Materials: Textiles, Polymer, Paper classification. Where do these materials come from, environmental links etc

Introduction to the workshop: Health and Safety



YEAR 7

KS3