



OVERVIEW

The Engineering course prepares students for a career in engineering, it provides in depth knowledge of nine sectors and the careers available in all these areas. Students will develop an understanding of how to manufacture products from orthographic drawing, through manufacture to evaluation, using a range of media and materials, from hand tools to CAD, metal to ceramics. Year 10 covers all the theoretical knowledge needed for the external exam through standalone theory lessons and as aspects of the mini synoptic projects. The practical projects build up in complexity and content, which provide the foundation for success at year 11.

Autumn

Theory - Engineering Disciplines, H&S

1. Mechanical Engineering
2. Electrical Engineering and Electronic Engineering
3. Aerospace Engineering
4. Telecommunications Engineering
5. Chemical Engineering
6. Civil Engineering
7. Automotive Engineering
8. Biomedical Engineering
9. Software Engineering
10. **Exam style end of unit assessment**
11. **Progression task**
12. Health and Safety – HASAWA and PPE
13. Manual Handling, COSHH and RIDDOR
14. **Exam style end of unit assessment**
15. **Progression task**

Toolbox

1. Intro to project, production planning and marking out.
2. Manufacture – drilling / bending
3. Manufacture – drilling / bending
4. Manufacture – riveting
5. Manufacture – riveting
6. CAD handle design
7. Manufacture – handle assembly
8. Manufacture – finishing.
9. Finishing/ Evaluation

Drawing tools

1. Create ruler in Fusion 360
2. Create drawing tools – squares
3. Create protractor
4. Create drawing stencils.

Drill and angle gauge

1. Design base, extrude and chamfer.
2. Design base, extrude and chamfer.
3. Test / orthographic drawing

Assessment:

Teacher assessment of theory – exam style marking for end of unit tests.

Teacher assessment – Mini NEA

AO1 Recall knowledge and show understanding.

AO2 Apply knowledge and understanding.

AO3 Analyse and evaluate knowledge and understanding.

AO4 Demonstrate and apply technical skills and processes.

AO5 Manage and evaluate the project.

Spring

Theory – properties of materials, tools and machinery.

1. Properties of materials – chemical, electrical,
2. Properties of materials – mechanical, optical, thermal.
3. Characteristics – aesthetics,
4. Environmental impact
5. Sustainability, renewable materials, and carbon footprint.
6. Metals
7. Polymers
8. Wood
9. Ceramics
10. Composites
11. **Exam style end of unit assessment**
12. **Progression task**
13. Hand tools
14. Machinery
15. **Exam style end of unit assessment**
16. **Progression task**

Engineers vice

1. Orthographic drawing – hand drawing
2. Orthographic drawing – hand drawing
3. Marking out jaws and Manufacture jaws
4. Manufacture jaws – file and drill.
5. Mark out, face off and thread bars.
6. Mark out, face off and thread bars.
7. Case hardening
8. Assemble – evaluate

Centre punch

1. Orthographic drawing – hand
2. Production plan
3. Turn and knurl.
4. Case hardening.

Assessment:

Teacher assessment of theory – exam style marking for end of unit tests.

Teacher assessment – Mini NEA

AO1 Recall knowledge and show understanding.

AO2 Apply knowledge and understanding.

AO3 Analyse and evaluate knowledge and understanding.

AO4 Demonstrate and apply technical skills and processes.

AO5 Manage and evaluate the project.

Summer

Theory - Engineering tools, equipment and machines

1. Marking out tools
2. Modification tools
3. Joining
4. Finishing
5. Safe use and control measures.

Applied processing skills and techniques

6. Skills and techniques
7. Prepare materials
8. Modify shape and size of materials
9. Join materials
10. Finish materials
11. **Exam style end of unit assessment**
12. **Progression task**

Theory – Science and maths in engineering.

1. SI units and application of base SI units.
2. Mass, length, amount of substance.
3. Equations for properties.
4. Energy, Force, mass, and motion
5. Area and volume
6. **Exam style end of unit assessment**

Mock exam – properties of materials, tools, equipment, machines. Processing skills. Science and maths in engineering. Engineering drawing.

Screwdriver

1. CAD handle drawing
2. CAD handle drawing
3. CAD orthographic
4. Production planning
5. Flat blade manufacture
6. Flat blade manufacture
7. Evaluation

Assessment:

Teacher assessment of theory – exam style marking for end of unit tests.

Mock Exam: Written Examination

Teacher assessment – CAD/ CAM project

AO1 Recall knowledge and show understanding.

AO2 Apply knowledge and understanding.

AO3 Analyse and evaluate knowledge and understanding.

AO4 Demonstrate and apply technical skills and processes.

AO5 Manage and evaluate the project.

Useful resources for supporting your child at home:

Excellent design sketching tutorials:

[product designer maker - YouTube](#)

Student access to Focus eLearning – direct link given to students.

Homework:

Homework will be set weekly; students will have a copy of the My Revision Notes textbook which they will use to respond to exam style questions.