Salford City Academy
The best in everyone™
Part of United Learning

Subject: Engineering

Year 10

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 synoptic projects build up in complexity and content, they are all past synoptic projects, 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 - **Progression Task - Electrical engineering**
4. Telecommunications Engineering
5. Chemical Engineering
6. Civil Engineering
7. Automotive Engineering **Progression Task - Chemical engineering**
8. Biomedical Engineering
9. **Exam style end of unit assessment**
10. **Progression task – feedback from EoUT**
11. Health and Safety – HASAWA and PPE
12. Manual Handling, COSHH and RIDDOR
13. **Exam style end of unit assessment**
14. **Progression task – feedback from EoUT**

Mini NEA
Bottle opener

1. Intro to project and marking out.
2. Manufacture – drill and shape
3. Manufacture – drill and shape
4. Manufacture – drill and shape
5. Manufacture – drill and shape
6. Manufacture – handle forming.
7. Manufacture – handle forming.
8. Manufacture – riveting
9. Finishing/ Evaluation

Stool

1. Intro to project, production plan.
2. mark out all pieces.
3. Manufacturing – mortise.
4. Manufacturing – mortise.
5. Manufacturing – bridle
6. Manufacturing – bridle
7. Manufacturing – corner halving

Assessment:

Teacher assessment 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 – Science and maths in engineering.

1. SI units and application of base SI units.
2. Current and Luminous Intensity
3. Thermodynamic Temperature
4. Mass, length, amount of substance.
5. Time
6. Equations for properties.
7. Energy, Force, mass, and motion
8. Area and volume
9. Exam style end of unit assessment
10. Progression task

Hand drawn Engineering drawings

1. Drawing conventions and BS:8888
2. Isometric drawing
3. Freehand sketching
4. Orthographic drawing 1
5. Orthographic drawing 2
6. Orthographic drawing 3
7. End of unit assessment

Stool

1. Manufacturing – corner halving
2. Manufacturing – seat
3. Manufacturing – assemble.
4. Manufacturing – finishing
5. Manufacturing – finishing
6. Assembly
7. Test / evaluate.

CAD/CAM and 3D printing.

1. Intro to 3D printing
2. Intro to parametric modelling.
3. Design challenge
4. Slicing techniques and materials
5. Customised slicing techniques.
6. Assessment
7. 3D printing and manufacturing
8. Sustainability and 3D printing.
9. Advanced CAD modelling
10. Advanced design skills
11. Advanced design challenge.

Assessment:

Teacher assessment 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 – properties of materials, tools and machinery.

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

Mini NEA – Dump Body

1. Analysis if the brief
2. Material research
3. CAD drawings
4. Hand drawn drawings
5. Production plan
6. Gantt chart
7. Base manufacture
8. Bend and shape dump and tailgate
9. Electronics
10. Assemble
11. Test
12. Evaluate

Assessment:

Teacher assessment theory – exam style marking for end of unit tests.
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 text book which they will use to respond to exam style questions.