SUTHERS DESIGN & TECHNOLOGY

Cambridge Nationals

YEAR 11

EXAM R038: Principles of Engineering Design

Core theory & specialist knowledge: Exam technique, and mock exam papers. Information retrieval techniques.

F: Evaluate & Test: Reflecting on how your product meets your design brief and specification through practical testing.

E: Realising ideas: Manufacturing your product using a range of skills and processes.

D: Modelling Modelling, testing and defining a manufacturing plan

C: Generating & Develop Ideas: Develop your ideas through sketches and models communicating ideas.

B: Specification Developing a brief and specification for your product.

A: Investigate Profiling users, analysing products, gathering research data.

NEA: R040 Design, production & modelling

CAD: Advanced CAD, applying ergonomic theory & inserts.

Investigate possibilities: What is the design context? What research can you carry out to gather ideas?.

Sustainability: Environmental and moral needs of product design.

Drawing techniques: 2 point perspective

NEA: Introduction to Design Brief and tasks

Resistant Materials: Manufacturing a mixed material product for a key user.

Design Theory: Inspired by key design movements, and iconic products

Iterations Developing a wide range of designs.

UCD: Designing for specific users using anthropometrical data and ergonomics.

NEA: R039: Communicating Designs

YEAR 10

PRACTICAL SKILLS: RECAP PROJECT

KNOWLEDGE LEARNING CHECK!

CAD: Develop independence in CAD using 3D design software to draw different components.

Craft Skills: Addition processes & wood joints. Using skills to develop high quality craftsmanship products.

Manufacturing methods: One off, batch, mass, continuous.

PASSIVE AMP PROJECT: ELECTRONICS & METAL

Graphics: Developing a striking 3D net for the passive amplifier.

Design: Mastering Isometric and rendering skills, iterating designs.

Materials: Working properties, and joining materials.

Electronics: Understanding how to solder a PCB

Learning about foundation principles in the design and manufacture of products for specific users.

Experience of multiple material areas with associated skills and theory.

YEAR 9

KNOWLEDGE LEARNING CHECK!

LAMP PROJECT ELECTRONICS

CLOCK PROJECT: Accuracy and precision

Primary research: Use a survey to critique your pendent. Ask a friend!

CAD: Develop independence in CAD using 2D design software to make complex design ideas.

Make: Measuring, basic joints, use of hand tools and some machinery.

Industry: Gain experience of working in industry for the day to a real world brief

Computer Aided Design: Begin to master 2D CAD, and experiment with 3D.

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

Drilling metals: H&S and importance of tolerance

Metalwork: Understanding material properties, and honing fine motor skills.

Pewter Casting: Working with metals, casting, cutting and finishing techniques.

Plastics: Using a strip heater to bend thermoplastics.

Processes: Designing formers, for vacuum forming. Pendent stand.

JEWELLERY PROJECT: CASTING/ CAD

Broadening knowledge of materials and processes. Project in year 8 build on the foundations of year 7, but increase the fluency of skill and design. A greater depth of knowledge is required, and more theoretical concepts are introduced.

YEAR 8

KNOWLEDGE LEARNING CHECK!

PENCIL HOLDER PROJECT: Developing the fundamentals

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

Health & Safety: Workshop Revisit/ Recall

Workshop machinery: Workshop fabrication

Graphics: Drawing for purpose and for explanation (isometric)

Standard components: Countersink, pilot and clearance holes

Finish: Applying a finish to a product

Materials: Plastics, softwood, and non ferrous metals

Product Analysis: What makes a product suitable, or desirable? How can we learn from others?

Workshop tools: Use of a range of tools to create a product

Materials: Investigating material properties and sources

Learning about foundation principles in the design and manufacture of products for specific users.

Experience of multiple material areas with associated skills and theory.

YEAR 7

Car project Basic skills & knowledge

Iterative Design Process: Understanding the design process.

Health & Safety: Workshop introductions

Welcome! Settling in, equipment and group identity

THE SUTHERS SCHOOL