KS4 Technology Curriculum Plan

This **detailed curriculum plan** for **Key Stage 4 (KS4) Technology** follows a structured approach to develop **practical, analytical, and theoretical knowledge** in preparation for **GCSE Design & Technology, Engineering, or related vocational pathways**. The curriculum aligns with the **AQA, OCR, or Edexcel GCSE specifications**, ensuring students master essential skills in **design, manufacturing, digital technology, and sustainability**.

**Curriculum Overview (KS4: Year 10 & Year 11)**

| **Year** | **Focus Areas** | **Key Learning Outcomes** |
| --- | --- | --- |
| **Year 10** | Core Principles & Practical Mastery | Materials, CAD/CAM, electronics, mechanisms, sustainability |
| **Year 11** | Specialisation & Exam Preparation | Iterative design, industry techniques, coursework (NEA) |

**Assessment Breakdown (GCSE Structure):**

* **Non-Exam Assessment (NEA - Coursework):** 50%
* **Written Exam (Core & Specialist Knowledge):** 50%

Each year includes **three core strands**:

1. **Design & Innovation** – User-centred design, CAD, and product development.
2. **Making & Practical Application** – Prototyping, engineering, electronics, and problem-solving.
3. **Technical Knowledge & Theory** – Industrial processes, sustainability, and design thinking.

**Year 10 Curriculum Plan – Core Knowledge & Skill Development**

**Autumn Term – Foundations in Design & Materials**

**Unit 1: Introduction to GCSE Technology & Industry Context**

* **Content:**
  + Overview of the design cycle.
  + Impact of technology on society.
  + Industry trends and career opportunities.
* **Skills:**
  + Researching technological advancements.
  + Analysing real-world product development.
* **Assessment:**
  + Industry case study report (100%).

**Unit 2: Materials & Manufacturing Techniques**

* **Content:**
  + Properties of woods, metals, polymers, smart materials, and composites.
  + Manufacturing techniques: Injection moulding, casting, CNC machining.
* **Skills:**
  + Testing material properties.
  + Manufacturing a small product using different processes.
* **Assessment:**
  + Materials research task (30%).
  + Small product prototype (70%).

**Spring Term – Advanced CAD/CAM & Digital Prototyping**

**Unit 3: Advanced CAD/CAM & 3D Printing**

* **Content:**
  + 3D modelling using Fusion 360/SolidWorks.
  + Laser cutting, CNC machining, and 3D printing applications.
* **Skills:**
  + Creating digital prototypes.
  + Preparing CAM files for production.
* **Assessment:**
  + CAD modelling project (80%).
  + Technical portfolio documentation (20%).

**Unit 4: Mechanisms, Electronics & Smart Systems**

* **Content:**
  + Gears, levers, pulleys, cams.
  + Circuit design, sensors, microcontrollers (Arduino, Micro: bit).
* **Skills:**
  + Programming simple electronic systems.
  + Integrating mechanisms in product design.
* **Assessment:**
  + Mechanically operated product (60%).
  + Quiz on electronic components (40%).

**Summer Term – Iterative Design & User-Centred Thinking**

**Unit 5: User-Centred Design & Ergonomics**

* **Content:**
  + Human factors in product design.
  + Anthropometrics, user research, and prototyping.
* **Skills:**
  + Conducting user testing and evaluation.
  + Iterative design using feedback.
* **Assessment:**
  + User-centred redesign project (100%).

**Unit 6: Sustainability & Circular Economy in Design**

* **Content:**
  + Lifecycle analysis, eco-friendly materials, repairability.
  + The 6 Rs of sustainability in manufacturing.
* **Skills:**
  + Designing sustainable products.
  + Analysing case studies of eco-conscious companies.
* **Assessment:**
  + Group sustainability presentation (40%).
  + Eco-product concept design (60%).

**Year 11 Curriculum Plan – Specialisation & Exam Preparation**

**Autumn Term – GCSE Non-Exam Assessment (NEA) Start**

**Unit 7: NEA Research & Initial Concepts (Coursework 50%)**

* **Content:**
  + Investigating a real-world problem.
  + Client/user needs and target market research.
* **Skills:**
  + Writing a design brief & specification.
  + Creating initial concept sketches.
* **Assessment:**
  + Research & analysis portfolio (100%).

**Unit 8: Detailed Design & Development**

* **Content:**
  + Refining designs through modelling and testing.
  + Justifying material and manufacturing choices.
* **Skills:**
  + Developing 3D prototypes.
  + Evaluating designs using stakeholder feedback.
* **Assessment:**
  + Iterative design folder (100%).

**Spring Term – NEA Practical & Written Exam Preparation**

**Unit 9: Manufacturing Final Product (NEA Practical Component)**

* **Content:**
  + Manufacturing using workshop and digital tools.
  + Finishing techniques and quality control.
* **Skills:**
  + Producing a fully functioning prototype.
  + Testing and refining product performance.
* **Assessment:**
  + NEA practical submission (100%).

**Unit 10: Exam Preparation – Core & Specialist Knowledge**

* **Content:**
  + Industrial processes & automation.
  + Exam techniques and past paper practice.
* **Skills:**
  + Answering long-form design questions.
  + Applying technical knowledge in timed conditions.
* **Assessment:**
  + Mock GCSE Exam (100%).

**Summer Term – Refinement & Final Exam Prep**

**Unit 11: Final NEA Submission & Exam Review**

* **Content:**
  + Final improvements to coursework.
  + Reviewing key theory concepts.
* **Skills:**
  + Preparing final coursework submission.
  + Revising effectively for the exam.
* **Assessment:**
  + NEA final submission (50%).
  + GCSE exam (50%).

**Assessment Summary for KS4**

| **Assessment Type** | **Weighting (%)** | **Assessment Method** |
| --- | --- | --- |
| **GCSE Non-Exam Assessment (NEA)** | 50% | Research, design, development, final product |
| **GCSE Written Exam** | 50% | Core & specialist knowledge, materials, industry |

**Conclusion**

**Balanced mix of practical and theoretical learning**  
**Emphasis on real-world applications and sustainability**  
**Progression from foundational skills (Y10) to specialisation (Y11)**  
**NEA coursework supports creativity and independent thinking**  
**GCSE preparation ensures high achievement and career readiness**

This **structured KS4 curriculum** ensures students develop **technical expertise, problem-solving skills, and industry knowledge**, preparing them for **A-Levels, apprenticeships, or careers in engineering, product design, and digital technology**.