Core Technical Principles	
1. **New and Emerging Technologies**	
○ Impact of new and emerging technologies on industry and society. ○ Sustainability and environmental considerations.	
2. **Energy Generation and Storage**	
○ Different types of energy generation. ○ Methods of energy storage.	
3. **Developments in New Materials**	
○ Modern and smart materials. ○ Composite materials and technical textiles.	
4. **Systems Approach to Designing**	
○ Inputs, processes, and outputs. ○ Use of systems diagrams.	
5. **Mechanical Devices**	
○ Types of motion (linear, rotary, reciprocating, oscillating). ○ Mechanisms (levers, linkages, cams, gears, pulleys).	
6. **Materials and Their Working Properties**	
○ Properties of papers and boards, natural and manufactured timber, metals and alloys, polymers, textiles.	
Specialist Technical Principles	
1. **Selection of Materials or Components**	
○ Factors influencing material selection. ○ Properties and uses of materials.	
2. **Forces and Stresses**	
○ How materials can be reinforced and stiffened. ○ Impact of forces and stresses on materials.	
3. **Ecological and Social Footprint**	
○ Life cycle assessment. ○ Ethical and social issues in design.	
4. **Sources and Origins**	

○ Where materials come from. ○ How materials are processed.	
5. **Using and Working with Materials**	
○ Techniques for shaping and forming materials. ○ Joining and assembly methods.	
6. **Stock Forms, Types, and Sizes**	
○ Standard forms and sizes of materials. ○ How materials are supplied and stored.	
7. **Scales of Production**	
○ One-off, batch, mass, and continuous production. ○ Impact of production scales on design and manufacturing.	
8. **Specialist Techniques and Processes**	
○ Techniques specific to different materials. ○ Use of tools and equipment.	
9. **Surface Treatments and Finishes**	
○ Methods of finishing materials. ○ Importance of surface treatments.	
Designing and Making Principles	
1. **Investigation, Primary and Secondary Data**	
○ Conducting research and gathering data. ○ Analysing and interpreting data.	
2. **Environmental, Social, and Economic Challenge**	
○ Addressing sustainability in design. ○ Considering social and economic impacts.	
3. **The Work of Others**	
○ Influence of designers and design movements. ○ Case studies of significant designs.	
4. **Design Strategies**	
○ Different approaches to designing. ○ Use of iterative design processes.	

5. **Communication of Design Ideas**	
o Sketching, modelling, and CAD. o Presenting and explaining design ideas.	
6. **Prototype Development**	
o Creating and testing prototypes. o Evaluating and refining designs.	
7. **Selection of Materials and Components**	
o Choosing appropriate materials for designs. o Considering functionality and aesthetics.	
8. **Tolerances**	
o Understanding and applying tolerances. o Importance of accuracy in manufacturing.	
9. **Material Management**	
o Efficient use of materials. o Reducing waste and optimizing resources.	
10. **Specialist Tools and Equipment**	
o Safe use of tools and equipment. o Techniques for different materials.	
11. **Techniques and Processes**	
o Practical skills in making. o Quality control and testing.	
12. **Viability of Design Solutions**	
o Assessing the feasibility of designs. o Considering cost, time, and resources.	