**Key Stage 5 Curriculum Map** Department: Design and Technology Term 2/3 - Theory

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| **Subject**  **Year** | Year 12  Design and Technology | *Overview/rationale & statement of importance – what learners can expect to gain from studying this subject this year*  In Year 12, students will gain deeper theoretical knowledge on a wider range of materials. These include: timbers, metals, papers and boards, polymers, modern materials, composites and SMART materials. Whilst applying these to design and make tasks, which are aimed to enhance the skills acquired from studying D&T at GCSE. Furthermore, Yr12 students will also gain knowledge and understanding of how scales of production, health and safety and the use of digital design have an impact in the design and manufacturing industries. | | | | |
| **No of weeks/lessons** | Term 2 – 2 lessons | Term 2 – 3 weeks (8 lessons) | Term 2 – 3 weeks (8 lessons) | Term 3 - 3 weeks (8 lessons) | Term 3 (2 weeks) 4 lessons | Term 3 (2 weeks) 4 lessons |
| **Unit Title** | Modern and Industrial Scales of Production | Digital Design and Manufacture | Anthropometrics and Ergonomics | Health and Safety | Protecting Designs and Intellectual Property | Design for Manufacturing, Maintenance, Repair and Disposal |
| **Objective** | To develop knowledge on scales of production, computer systems, assembly lines and modern manufacturing systems e.g. JIT and FMS. | Students to be aware of how different CAD/CAM systems, rapid prototyping, virtual modelling are used in developing and manufacturing products. | Students will need to apply this topic to their own designs in order to develop products for specific clients and users. | Students to be aware of: safe working practices, Health & Safety Work Act 1974, COSHH procedures, legislation and how products are made safe. | Students will need to know the difference between copyrights, patents, trademarks and open designs. | Students will need to be able to develop knowledge and understanding of how the choice of material affects the environment through looking at the 6Rs and what can be done to make products more sustainable. |
| **Iterative Links** | Building on what has been covered at GCSE but in more detail. | Pupils covered some of this at GCSE and have experienced using CAD/CAM systems in their own projects. | Building on knowledge and understanding of ergonomic and anthropometrics learnt at GCSE. | Building on knowledge and understanding of workshop rules and topics covered in Yr11. | Building on knowledge and understanding of papers and boards covered at GCSE. | Building on knowledge and understanding of 6Rs and sustainability learnt in Yr11. |
| **Knowledge & Understanding** | To gain knowledge and understanding of scales of production  To know different types of computer systems and storage  To be able to understand unit system production, vertical in-house production, modular/cell production and flexible manufacturing systems. | To gain knowledge and understanding of how CAD/CAM is used in industry  To know how virtual modelling is used in industry  To know how rapid prototyping is used to develop products  To know how EPOS is used to market a product  To be aware of how planning and control systems are used in manufacturing (Kanbans/RFID). | To gain knowledge and understanding of how aesthetics, ergonomics and anthropometrics are considered when designing products. | To gain knowledge and understanding of risk assessments, safe working practices in school workshops, COSHH regulations and the Health and Safety Act 1974.  To know how designers and manufacturers ensure products are safe  To know how consumers are protected to ensure products are safe through BSI, testing and advice. | To gain knowledge and understanding of copyrights, patents, registered designs, trademarks and logos and the importance to the designer.  To gain knowledge and understanding of the concept of open design. | To gain knowledge and understanding of how the choice of material affects the use, care and disposal.  To know the application of the 6Rs of sustainability.  To be able to modify designs to make them more efficient i.e. reducing materials or parts.  To understand how maintenance can prolong a products life.  To understand how products can be designed and manufactured, with disassembly in mind. |
| **Skills** | To be able to link the theory to real life case studies and apply this to their own projects. | To be able to link the theory to real life case studies and apply this to their own projects. | Students to be able to design small scale products for the specific users, for example: the elderly, specific operations and inclusive designs. | To be able to link the theory to real life case studies and apply this to their own projects. | To be able to link the theory to real life case studies and apply this to their own projects. | To apply this to case studies. |
| **Literacy** | Theoretical work, exam questions. | Theoretical work, exam questions. | Theoretical work, exam questions. | Theoretical work, exam questions. | Theoretical work, exam questions. | Theoretical work, exam questions |
| **Numeracy** | Maths based questions linking to topic. | Maths based questions linked to topic. | Anthropometric Data and measurement charts. | Maths based questions linked to topic. |  |  |
| **Assessment** | SWIK: exam style questions  End of unit test (S)  PLC check | SWIK: short exam style questions (F)  End of unit test (S)  PLC check | SWIK: short exam style questions (F)  Design Ideas for specific users  PLC check | SWIK: short exam style questions (F)  End of unit test (S)  PLC check | SWIK: short exam style questions (F)  End of unit test (S)  PLC check | SWIK: short exam style questions (F)  End of unit test (S)  PLC check |
| **Health and Safety** |  |  |  |  |  |  |
| **Cross-curricular** | Science, Maths, Engineering, Business Studies. | Science, Maths, Engineering, Business Studies. | Science, Maths, Engineering. | Science, Maths, Engineering, Law | Business Studies, Law | Science, Maths, Engineering, Business Studies. |

Approximately 60 lessons

35 lessons