

Unit 11 Product design considerations PLC

Topic Area	RAG Before Taught	RAG After Taught	RAG after Assessment	RAG after revising	RAG after Mocks
Through the study and critical analysis of existing products, students should develop an understanding of the requirements of the following: • the design, development and manufacture of products to meet specification criteria • fitness for purpose • accuracy of production • how the critical assessment of products can lead to the development of new designs. Students should develop the skills to critically assess products and develop new design proposals. Students should develop their ability to work with a variety of materials, including two and three-dimensional forms, to produce creative and original products which satisfy the demands of the target market, and consider accurate and efficient manufacture. When designing products Students should consider aesthetics, ergonomics and anthropometrics.					
Students should be aware of, and be able to explain, the development of products that are inclusive in their design so that they can be used by a wide range of users including the disabled, children and the elderly.					
Students should be aware of, and be able to explain, the importance of the following to the designer: • copyright and design rights • patents • registered designs • trademarks • logos.					
Students should be aware of, and be able to explain, the concept of 'open design'. Specifically referring to the development of products for the common good of society, including potential use. Students should be able to give examples of this in practice, eg humanitarian projects and file sharing for 3D printing					
Students should be aware of, and be able to explain, how a product can be designed and manufactured with disassembly in mind, including integral fixings and active disassembly using smart materials such as SMA and biodegradable parts					
Students should be aware of, and be able to explain, the need to modify designs to make them more efficient to manufacture, including: • reducing the number of manufacturing processes • how the choice of materials affects the use, care and disposal of products: • labelling of materials to aid separation for recycling • making products easy to disassemble or separate • application of the six Rs of sustainability: • reduce the quantity of materials, of toxic materials, of damaging materials and associated energy use • reuse components and parts • rethink by using eco friendly alternative materials • recycle materials and/or components into new products • maintenance: • temporary and integral fixings • use of standardised parts • allowing for service and repair/ replacement of parts • ability to upgrade with software downloads.					
Students should be aware of, and be able to explain, the different ways in which a product can be designed to allow for more efficient manufacture, including: • ribs and webbing to reduce material thicknesses • snap fittings to remove the need for fixings/adhesives • internal moulded screw posts for use with self tapping screws • use of pre made components • use of standardised patterns and sizes • addition of texture in moulding to reduce number of manufacturing processes • self finishing.					
Students should be aware of, and be able to discuss and demonstrate, good and safe working practices, including: • the importance of using the					

correct tools and equipment for specific tasks • the importance of ensuring their own safety and that of others when in a workshop situation • how designs are developed from a single prototype into mass produced products • the effect on the manufacturing process that is brought about by the need for batch and mass manufacture • how to select the most appropriate manufacturing process to be able to realise their, or others', design proposals • the importance of health and safety in a commercial setting including workforce training and national safety standards.					
Students should be aware of, and able to explain, health and safety procedures related to products and manufacturing, including: • knowledge of the Health and Safety at Work Act (1974), and how it influences the safe manufacture of products • control of Substances Hazardous to Health (COSHH) and safety precautions that should be taken with relevant materials • safe working practices and identifying potential hazards for the school or college workshop and industrial contexts • safety precautions that should be taken with specific manufacturing processes • the concept of risk assessment and its application to given manufacturing processes.					
Students should be aware of, and able to explain, how designers and manufacturers ensure products are safe for consumers to use, including: • legislation used to protect consumers and its impact on product design, eg Consumer Rights Act (2015), Sales of Goods Act (1979) • the British Standards Institute (BSI), and how specific products might be tested to meet safety standards • measures to ensure the safety of toys, eg Lion Mark • advice to consumers: • manufacturer's instructions • safety warnings • aftercare advice.					