

Design & market influences

Evolution of Product Design, candidates should:	
	identify ways in which products evolve over time because of developments in ideas, materials, manufacturing processes and technologies as well as because of social, political, cultural and environmental changes;
	have a basic knowledge and understanding of major design movements since 1900 e.g. Arts & Crafts Movement, Art Nouveau, Art Deco, Bauhaus, Modernism, De Stijl, Memphis, Post Modernism;
	recognise that design movements and cultural influences are still influencing new product development;
	have a knowledge and understanding that manufacturing industries are involved in continuous improvement (CI) and this is a major influence in product evolution;
	have a knowledge and understanding that sometimes new products are developed because of marketing pull and sometimes because of technological push.

Design in Practice

Product development, candidates should:	
	respond creatively to briefs, developing their own proposals and producing specifications for products and associated services
	discuss and analyse the situation/problem;
	know how to gather and respond to research, evaluate and select information and data to support the design and manufacture of products;
	consider the factors involved in the design of a product which is to be produced/manufactured in quantity;
	consider a wide range of users and create designs which are inclusive;
	determine the degree of accuracy required for the product to function as planned, taking account of critical dimensions and tolerances in determining methods of manufacture;
	understand how graphic techniques, ICT equipment and software, particularly CAD, can be used in a variety of ways to model aspects of design proposals and assist in making decisions;
	have a knowledge and understanding that design ideas are protected in law through copyright, patents and registered designs.
Communication and representation of ideas, candidates should:	
	use a range of graphical techniques such as annotated sketches, formal drawing conventions, CAD to communicate design details in a clear and appropriate manner;
	develop a range of presentation techniques and media to portray materials, texture or finish such as mood boards, presentation drawings, digital photography, CAD;
	use line, tone, colour rendering using a range of media;
	use formal page layout techniques as an aid to planning and presenting drawings and information;
	use a range of prototyping and modelling methods in order to explore design alternatives during the design process as well as a means of communicating proposals which can be used for evaluation purposes;
	use a range of ICT equipment and software to communicate, model, develop and present ideas.
Design Methodology, candidates should:	
	understand that designing is not a linear exercise but is iterative. The traditional design cycle is just one of many methods for successful designing;
	understand that empirical problem solving, a systems approach and intuitive designing are all valid approaches to designing;
	experience a variety of design approaches.
	Be able to use the following as starting points for designing and making: <ul style="list-style-type: none"> • natural form, pattern and structure • geometry and mathematics • the work of well known artists, designers, • craftsmen and technologists • detailed product analysis • religious and cultural influences.
Packaging, candidates should:	
	have a knowledge and understanding of a variety of materials and processes used to package products and to be able to balance the likely impact upon the environment in terms of social responsibility and sustainability;
	understand the different basic functions of packaging such as protect, inform, contain, transport, preserve and display;
	have a knowledge and understanding of the need for product labelling and the common symbols used to indicated hazards, storage and handling, maintenance, disposal and design protection.
Product marketing, candidates should:	
	have a knowledge and understanding of the power of branding and advertising and the effect that they have upon different consumer groups;

be able to promote their own products using a variety of techniques, e.g. leaflets, flyers, point of sale, packaging and digital media.

Design in the human context

Human factors, candidates should understand:	
	that for products to be effective, designers, manufacturers and craftsmen need to take account of a wide range of human factors in an attempt to produce inclusive rather than exclusive designs i.e. access, cultural values;
	that anthropometrics and ergonomic considerations affect many design decisions;
	that design decisions for large scale manufacturing often aim to cover the needs of the 5th–95th percentile;
	the effect of colour used in product design to reinforce messages such as “danger” or to help to produce moods such as “warmth”;
	social, economic and ethnic groups of people often have specific values and needs which can be an aid to focused designing, i.e. disabled, elderly, religious groups;
	that efficient manufacturing systems result from the layout of materials, equipment and controls, such as working triangles in the kitchen, production lines, assembly lines.
Safety, candidates should understand:	
	<ul style="list-style-type: none"> • the relevance of safety with regard to themselves, the manufacturer and the product user; • that designers and manufacturers have both a moral and legal responsibility for the products that they create; • how to undertake simple tests to ensure that the products they make are safe for the specific user group they are designed for; • the importance of risk assessment at all stages of designing and making.
Quality, candidates should:	
	ensure that their products are of a suitable quality for their intended user;
	understand that many judgements regarding quality are subjective and will be dependent upon various criteria e.g. cost, availability of resources and other social factors;
	have a knowledge and understanding of commercial methods which are used to improve quality assurance e.g. quality circles, teamworking, BS EN ISO 9000;
	be able to devise and apply test procedures to check the quality of their work at critical points during development and manufacture, and to indicate ways of improving it.
Ethical, Environmental and Sustainability Issues, candidates should:	
	take into consideration the ethical, environmental and sustainability issues relating to the design and manufacture of products i.e. fair trade, product miles, carbon footprint, product disposal, and the following related principles: re-use, recycle, repair, reduce, rethink, refuse, etc.
	have a knowledge and understanding of the main factors governing environmentally friendly products, or “Green Designs” and be able to identify a range of these;
	have a knowledge and understanding of the main factors relating to recycling and/or reusing materials or products i.e. material identification, material separation, collection, processing,
Consumer issues	
	have a knowledge and understanding of the work of consumer groups and pressure groups and the way products are evaluated – e.g. <i>Which?</i> reports;
	have a knowledge and understanding of the work of standards agencies (BSI, ISO etc) and how these standards affect product design and manufacture and subsequent testing;
	have a knowledge and understanding that a wide range of legislation exists to protect consumers and that designers and manufacturers need to conform to it.