CURRICULUM CONTENT

The curriculum objectives in Part 1 are to be followed by all students. This will be assessed specifically in Paper 1 (Design) and Coursework. It is envisaged that this core content will also be covered, in an integrated manner in the teaching of the optional specialist area from Part 2.

PART 1

	Candidates should be able to:
Observe need/requirement	identify and describe needs and opportunities for design and technological improvement;
Design brief/specification	analyse and produce design specifications for problems which have been self-identified or posed by others;
Identification/research	identify the constraints imposed by knowledge, resource availability and/or external sources which influenced proposed solutions;
	gather, order and assess information relevant to the solution of practical/technological problems;
	produce and/or interpret data (e.g. diagrams, flow charts, graphs, experimental and test results);
Generation of possible ideas	generate and record ideas as potential solutions to problems using a range of techniques;
	identify the resources needed for the solution of practical/technological problems;
	use a variety of media and equipment to produce models and mock-ups as a means of exploring a problem and as a means of testing the feasibility of a solution;
	recognise the need for continuous appraisal of their own progress, thinking and decision making, in order to provide themselves with opportunities for review;
	relate these judgements to the purpose of their study, in particular the specification which they set themselves;
Selection/organisation	select and develop a solution after consideration of time, cost, skill and resources;
	organise and plan in detail the production of the selected solution;
Evaluation	evaluate existing products/systems, the work of others and their own work;
	check the performance of the product/solution against the original specification;
	use different methods and sources to assess the effectiveness of a product (e.g. sampling, questionnaires, interviews);
	suggest any possible modification and improvements (consideration to include functional, safety, aesthetic, ergonomic and economic factors);
Implementation and realisation	show an awareness of correct procedures for their preparation;
	show an awareness of the correct and accurate methods of drawing, marking out and testing;
	select appropriate processes for shaping, forming, cutting, joining, fitting, assembling and finishing a variety of materials;

Health and Safety	show an awareness of the correct use of hand and machine tools and equipment;
	show a proper regard for all mandatory and other necessary safety precautions relevant to the use of a variety of tools, machines, materials and other resources;
	show a concern for economy in the use of materials, components, media, time, energy and other resources;
Initiation and development of ideas, and recording of data	extract relevant information from sources (written, graphical, oral, computer based); interpret and record information and data;
Communicating ideas with others	use technical vocabulary, number skills, colour, shading and other media to produce sketches, models, diagrams, drawings (such as perspective, isometric, orthographic, sequential) and written materials, which communicate their ideas with precision and clarity;
Design and Technology in Society	show awareness of the effect of design and technology activity on social, environmental and economic issues;
	demonstrate awareness of the role of designers, craftsmen and technologists in industry and society;
	take account of human needs in aspects as diverse as aesthetic, ergonomic, economic, environmental, cultural and social;
Aesthetics	appreciate the use of line, shape, form, proportion, space, colour and texture as appropriate to their designed solutions and the work of others;
Anthropometrics and Ergonomics	demonstrate an understanding of the concept of ergonomics and the use of anthropometric data in their own design work and that of others;
Energy	recognise that different forms of energy sources exist, namely, fossil fuels, nuclear, solar, water power;
	understand how different sources and forms of energy can be stored, converted and transmitted to produce a work capability and to improve the quality of life;
	understand the inefficiencies of energy conversion methods, e.g. ‘losses’ into by-products such as heat, light and sound;
	understand the difference between the finite and almost finite nature of energy sources and how through design, all energy sources can be conserved;
	use energy sources effectively and efficiently;
Control	identify the features of a control system in terms of input devices, processing elements, output devices, feedback;
Mechanical Control (Static)	understand the use of common fastenings and fittings applicable to the holding of metal, wood, plastics, card and paper;
Permanent Fastenings	choose sensibly between common and appropriate methods applicable to most common materials; this should include simple joining, the use of adhesives, riveting and welding;

Mechanical Control (Dynamic)	understand methods of transmitting motion using simple systems only; examples should include belts, chains, pulleys, gears and cams.

Note that the use of CAD/CAM is encouraged throughout the curriculum if facilities are available. However, candidates will not be tested on CAD/CAM in the examination.