

■ IB Design & Technology HL and SL

Introduction

Design involves gaining information about the world around us, processing it and then using it to form a strategy or alter a situation. The designer is interested in not only the consumer / material environment but also the political social and economic considerations which affect people's priorities. This programme assumes no previous knowledge of design technology and is suitable for the scientist (particularly a physicist) or non-science specialist. The course utilises knowledge, skills and the design process within problem-solving contexts and uses local and readily available resources. The design cycle is at the core of the programme. The core is about designing and the role of designers. All students complete a design and manufacture based project lasting approx. 28 hours for SL or 41 hours for HL.

Content

All students study the following topics as part of the IB core.

1. Design Process – design cycle, generating ideas, developing concepts.
2. Product Innovation – designers and product cycle, invention and innovation, people and markets.
3. Green Design – principles, life cycle analysis and strategies for green design.
4. Materials – classification of materials, properties of materials, timber, metals, plastics, ceramics and composites.
5. Product Development – manufacturing techniques, craft production, mechanisation, automation and economic consideration.
6. Product Design – ergonomics and the designer in society.
7. Evaluation – evaluation and designing, evaluation and manufacture, evaluation and the consumer.

At Higher Level, students also study these additional topics.

8. Energy – machines, types of energy, transport and renewable resources.
9. Structures – forces, strength and stiffness (inc. Young's Modulus), beams.
10. Mechanical Design - general concepts, mechanical motion, conversion.
11. Advanced Manufacturing Techniques – joining, moulding, casting, forming.
12. Sustainable Development – appropriate technologies, architecture.

All students also study Computer Aided Design and Computer Aided Manufacture.

Assessment

The external assessment at both Standard and Higher Level (64%) consists of three written papers containing multiple choice, data based, short answer and extended response questions. The internal assessment consists of practical investigations and the Group Four project (18%), along with a student driven design and manufacture project (18%).

Facilities

Workshop One

Equipment includes: 8 x woodworking benches, 2 x metal work benches, circular saw, radial arm saw, planer-thicknesser, 2 x Startrite bandsaws, 2.3m industrial spray booth with drying facility, vacuum forming machine, plastic dip coating machine, strip heater, convection oven, shot blasting unit, union graduate wood lathe, union graduate bowl lathe, 3 x metal centre lathes, milling machine, 3 x pillar drills, sheet metal fabrication equipment, 1.6m metal guillotine, mortising machine, abrasive disc sander, abrasive belt sander, 2 x scroll saws, polishing wheels, plasma cutter, MIG Welder, TIG welder, Resistance Welding (Spot), Oxy-Acetylene brazing, electronics / soldering equipment and numerous hand / fabrication tools. Donaldson Torit high capacity externally located extraction unit.

Workshop Two (commissioned Sept 2007)

Equipment includes: 5 x large woodworking benches, 2 x large metalwork benches, 2 x Startrite 351SB Bandsaws, Engineering Pillar Drill, MACC TE250 Metal Chopsaw with coolant, SIEG U2 Mill / Drill / Grinder with LCD readout, JET oscillating spindle sander, JET 300mm Abrasive Disc Sander, Oscillating vertical or horizontal abrasive belt sander, table mounted inverted Bosch router, numerous hand / fabrication tools. ESTA high capacity externally located extraction unit fitted with 120mm multi-position extraction hood and workshop cleaning kit. Numerous hand and fabrication tools.

CAD / CAM Suite

A2+ size CO² Laser Cutting Machine, CAMM-2 2D / 3D Modelling Centre and a CAMM-1 vinyl cutting machine.

Design Studio One (L4)

17 x Dual Core Dell Optiplex 745 PC's with 17" LCD Displays (Software includes: Pro Desktop v8.0 3D CAD, Adobe CS3 Photoshop, Illustrator, InDesign, Designer, and Acrobat Professional. Techsoft 2D Design v2.0, MS Office, and Netsupport v9.0) Apple G4 Powermac with video editing facilities, SMARTboard and Data projector, Samsung visualiser, A3 colour flatbed USB Scanner, A4 CMYK colour laser printer, DVD / VHS player and ceiling mounted speaker system, 2.2m Octagonal graphics and discussion table.

Design Studio Two (L3)

16 x Compaq thin clients with LCD Displays connected to the school CITRIX network, Apple G4 Powermac with Adobe CS2 installed, large format SMARTboard and Data projector, A3 colour flatbed USB Scanner, A4 mono laser printer, DVD / VHS player and ceiling mounted speaker system, 2.2m Octagonal graphics and discussion table. (Room due to be upgraded to same spec as Design Studio One at Easter '08)

Other:

Colour printing up to A3 (AVA Room) in size and two digital cameras are available along with full audio visual facilities.