# S2 Design and Manufacture

# *Course Content

* Sketching – 2D and 3D
* 3D Computer modelling using Autodesk Inventor
* Wooden Joint exercise
* Trowel Project
* Small shelf
* Idea Generation
* Torch Design
* Desktop Architecture
* Scottish Sports Medal

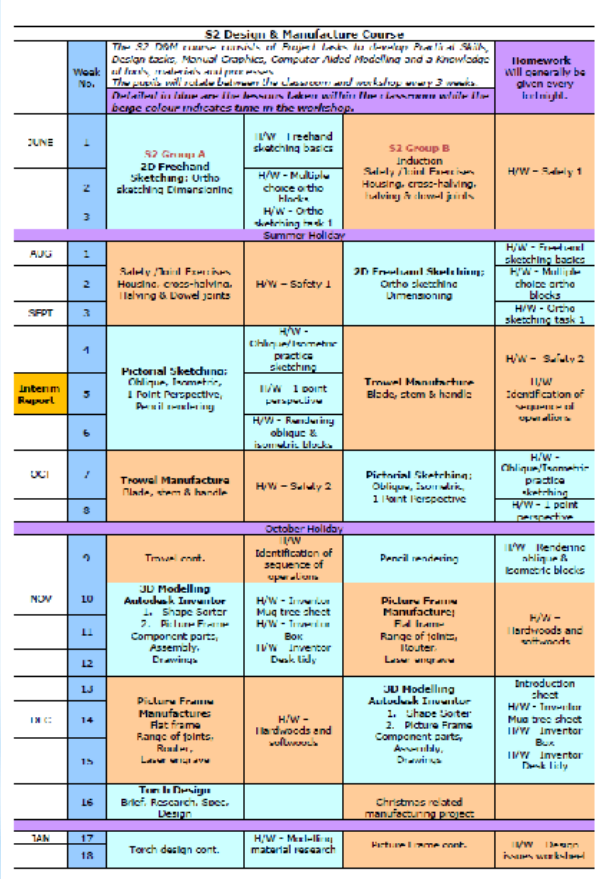
# *Resources Provided

- All necessary stationery equipment
- Computers with 3D modelling software
- Modelling materials such as Card and Foam
- Project materials in wood, plastic and metal
- **Laser cutter** to enhance project work
- Modern Design Studios and Workshops
- GLOW
- Course Textbooks by Leckie & Leckie
- **3D Printer**

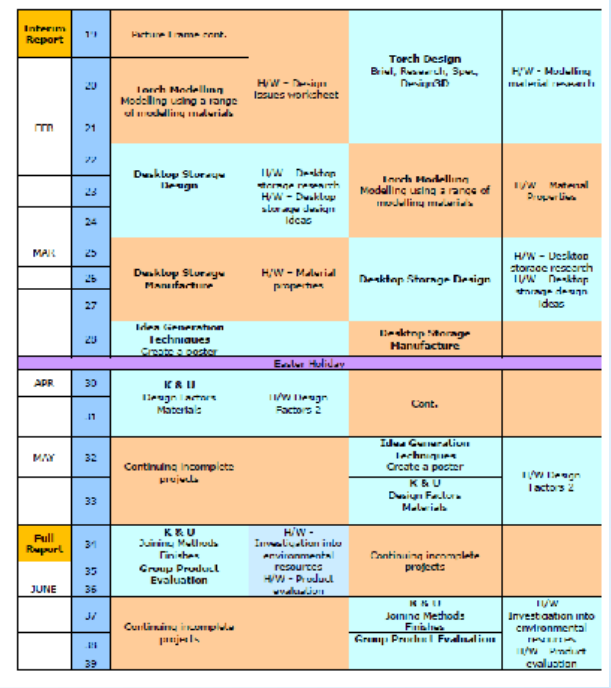
Example of a Styrofoam model

Example of a rapid prototype model

# *S2 Timeline



| S2 Design & Manufacture Course | | | | | |
|---|---|---|---|---|---|
| | Week No. | The S2 D&M course consists of Project Tasks to develop Practical Skills, Design tasks, Manual Graphics, Computer Aided Modelling and a Knowledge of tools, materials and processes. The tasks will rotate between the classroom and workshop every 3 weeks. Detailed in blue are the lessons taken within the classroom while the beige colour indicates time in the workshop. | | | Homework will generally be given every fortnight. |
| JUNE | 1 | S2 Group A 2D Freehand Sketching: Ortho sketching Dimensioning | H/W - Freehand sketching basics | S2 Group B Induction Safety /Third Exercises Housing, cross-halving, Halving & Dowel joints | H/W – Safety 1 |
| | 2 | | H/W - Multiple choice ortho blocks | | |
| | 3 | | H/W - Ortho sketching task 1 | | |
| Summer Holiday | | | | | |
| AUG | 1 | Safety /Third Exercises Housing, cross-halving, Halving & Dowel joints | H/W – Safety 1 | 2D Freehand Sketching: Ortho sketching Dimensioning | H/W - Freehand sketching basics |
| | 2 | | | | H/W - Multiple choice ortho blocks |
| SEPT | 3 | | | | H/W - Ortho sketching task 1 |
| | 4 | Pictorial Sketching: Oblique, Isometric, 1 Point Perspective, Pencil rendering | H/W - Oblique/Isometric practice sketching | Trowel Manufacture Blade, stem & handle | H/W – Safety 2 |
| Interim Report | 5 | | I/W 1 point perspective | | I/W Identification of sequence of operations |
| | 6 | | H/W - Rendering oblique & Isometric blocks | | |
| OCT | 7 | Trowel Manufacture Blade, stem & handle | H/W – Safety 2 | Pictorial Sketching: Oblique, Isometric, 1 Point Perspective | H/W - Oblique/Isometric practice sketching |
| | 8 | | | | H/W - 1 point perspective |
| October Holiday | | | | | |
| NOV | 9 | Trowel cont. | I/W Identification of sequence of operations | Pencil rendering | I/W Rendering oblique & Isometric blocks |
| | 10 | 3D Modelling Autodesk Inventor 1. Shape Sorter 2. Picture Frame Component parts, Assembly, Drawings | H/W - Inventor Mug tree sheet H/W - Inventor Box I/W Inventor Desk tidy | Picture Frame Manufacture: Flat frame Range of joints, Router, Laser engrave | H/W – Hardwoods and softwoods |
| | 11 | | | | |
| | 12 | | | | |
| DEC | 13 | Picture Frame Manufacture: Flat frame Range of joints, Router, Laser engrave | H/W – Hardwoods and softwoods | 3D Modelling Autodesk Inventor 1. Shape Sorter 2. Picture Frame Component parts, Assembly, Drawings | Introduction sheet H/W - Inventor Mug tree sheet I/W Inventor Box I/W Inventor Desk tidy |
| | 14 | | | | |
| | 15 | | | | |
| | 16 | Torch Design Brief, Research, Spec, Design | | Christmas related manufacturing project | |
| JAN | 17 | Torch design cont. | H/W - Modelling material research | Picture Frame cont. | I/W Design Issues worksheet |
| | 18 | | | | |



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|---|---|---|---|---|---|
| Interim Report | 19 | Picture Frame cont. | | Torch Design Brief, Research, Spec, Design/3D | H/W - Modelling material research |
| FEB | 20 | Torch Modelling Modelling using a range of modelling materials | H/W – Design Issues worksheet | | |
| | 21 | | | | |
| | 22 | Desktop Storage Design | I/W Desktop storage research H/W – Desktop storage design ideas | Torch Modelling Modelling using a range of modelling materials | I/W Material Properties |
| | 23 | | | | |
| MAR | 24 | | | | |
| | 25 | Desktop Storage Manufacture | H/W – Material properties | Desktop Storage Design | H/W – Desktop storage research I/W Desktop storage design ideas |
| | 26 | | | | |
| | 27 | Idea Generation Techniques Create a poster | | Desktop Storage Manufacture | |
| | 28 | | | | |
| Easter Holiday | | | | | |
| APR | 30 | K & U Design Factors Materials | I/W Design Factors 2 | Cont. | |
| | 31 | | | | |
| MAY | 32 | Continuing incomplete projects | | Idea Generation Techniques Create a poster | I/W Design Factors 2 |
| | 33 | | | K & U Design Factors Materials | |
| Full Report | 34 | K & U Joining Methods Finishes Group Product Evaluation | H/W - Investigation into environmental resources H/W - Product evaluation | Continuing incomplete projects | |
| | 35 | | | | |
| JUNE | 36 | | | | |
| | 37 | Continuing incomplete projects | | K & U Joining Methods Finishes Group Product Evaluation | I/W Investigation into environmental resources I/W Product evaluation |
| | 38 | | | | |
| | 39 | | | | |

# *Timelines

# *Skills Developed

* *How to Analyse a Brief*, carry out *Research* and produce *2D* and *3D Designs*
* How to *Annotate* their designs
* Produce *3D computer models*
* Read and Interpret *Working drawings*
* *Measure and Mark-out* and use various *Hand Tools* to produce *Wooden Joint Exercises* and *Picture Frame*
* Mark-out and use various Hand Tools to produce a small *Garden Trowel* in *Metal*.

# *Forms of Assessment

* Skills Based, by Response
* Pupil Assessment
* Peer Assessment
* Folio work
* Project work
* Homework
* S3 Class Test
* S4 National Qualifications
* Design 45 marks, Manufacture 55 marks (55%)
  Exam 80 marks (45%)

* **ICT to enhance learning** **Fourth Level**

* *I can use ICT effectively in different learning contexts across the curriculum to access, select and present relevant information in a range of tasks.* TCH 4-03b

* **Craft, design, engineering and graphics contexts for developing technological skills and knowledge**

* *I can confidently apply preparation techniques and processes to manufacture items using specialist skills, materials, tools and software in my place of learning, at home or in the world of work.* TCH 4-13a

# *E's & O's

# *Additional Support

* Additional support from PSA's and co-op teachers, as required.