

# Design and Fabrication 1202

## Unit 1 - Introduction to Design

- Topic 1-1: History of Design (1 hour)
- Topic 1-2: The Design Process (4 hours)
- Topic 1-3: Social/Environmental Considerations (2 hours)
- **Topic 1-4: Design in Fabrication (2 hours)**
- Topic 1-5: Careers in Design (1 hour)
- This unit introduces students to the engineering design process and provides the basis for the remaining units.
- Students will review the history of the design process and examine how it has evolved. You will also examine various fabrication techniques and discover how design and fabrication are interrelated.

## Topic 4 – Design for Fabrication

### Design for Manufacturing and Assembly

Design impacts the manufacturing methods required and the associated differences in production cost.

- It reduces part count thereby reducing cost. If a design is easier to produce and assemble, it can be done in less time, so it is less expensive.
- It increases reliability, because if the production process is simplified, then there is less opportunity for errors.

*\*\*See LRS-U1-T4-1*

### Types of Drawings

#### 1. WORKING DRAWING

- A working drawing is the final 'constructed' drawing, produced as part of the design process. It usually consists of a front, side and top view of the solution. Dimensions are added so that any person using the working drawing can manufacture the design. Usually there are at least six dimensions but you can add as many as you feel are required in order for the manufacturer to make your solution.
- The working drawing should be precise and drawn to a scale. If the drawing is half the size of the solution then the scale is 1:2. If the drawing is a 3rd the size of the solution then the scale is 1:3.

#### The PARTS LIST

A 'Parts List' is a very important feature of the working drawing as all the parts are listed, with measurements. The materials used are also mentioned as well as the finish applied to the individual pieces.

## 2. Assembly drawings

An assembly drawing shows the various parts of a product drawn to show exactly how they fit together.

They are often used for products such as construction and model kits or flat-pack furniture, to show the user how to assemble the parts.

They can be drawn in two ways.

- A fitted assembly drawing shows the parts put together, and can be drawn in 2D or 3D.
- An exploded drawing shows the parts separated, but in the correct relationship for fitting together. Exploded views are usually drawn in 3D, as illustrated.
  - Exploded views are often a good way of showing detail. The picture below shows the pens disassembled. It is important to recognize that all the parts are in line with each other, drawn usually along a centre line which is drawn through the entire centre of the design.

## Other Types of Drawings

Section drawings usually show a cutaway view of an object.

Detail drawings are enlarged views of portions of an object. They are used to show additional detail