

Product Design

B.E. Sem. VIII [PROD]

(Elective – I)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

1. Introduction

Stages in Product Design, Consideration in designing, Concept of line, texture, colour, form, balance, proportions, size, shape, mass, Spatial relationship and compositions in 2 and 3 dimensional space, radii manipulation and form transition. Graphic composition and layout. Use of grids in graphic – composition.

Exploration and study of formal elements to develop visual awareness, imagination and creative insight. Form elements in the context of product design, modular concepts in design. Introduction to colour and colour as an element in design. Colour classification and dimensions of colour , hue, value and chroma relationships, colour dynamics and interaction of colours. Psychological use of colours.

2. Conceptual Design & Marketing

Market research, product planning and product positioning, understanding of problem areas and limitations. User group and their cultural, physical and psychological background. Need based origin of a product, and technology driven products, Analysis of ideas from various angles of design methodology to fit it to the user needs. Analysis of function, component process study through computer simulation, building, reliability into the product.

2D presentation, rendering, sketches of concept drawings and computer generated images, 3D presentations in the form of dummy and prototypes.

3. Material science and product detailing

Overview of materials including new age materials & their characteristics, Material selection process.

4. Product Ergonomics

Gross human autonomy, anthropometry, Environmental conditions including thermal, illusion, noise & vibration controls and displays, Psycho and physiological aspects of design.

5. Designing for production

Process consideration in Design, Design of cast members, welded parts, Designing parts to be machined, designing for easy assembly, convenience of maintenance, operation and safety. Tolerance system, standardization. Preferred number series.

Usage of Polymeric Materials, its application and properties, Mechanical behaviour of polymers, designing for polymeric products to be injection moulded, blow moulded & extruded. Designing for load bearing applications.

6. Analysis and organization of control panel & displays in product design.

Functions and controls, Display elements, dials, knobs, buttons, handles, and electronics displays, investigation of the study of visual, functional & Ergonomical requirements of controls and display elements. Study of product graphics and textures.

7. Product aesthetics

Visual communication skills related to product and services. Typeface, layouts, illustrations, sketches for leaflets and instructions. Exploded views for service manuals and catalogues. Forms in nature. Generation of product forms with analogies from nature.

8. Role of creativity in problem solving Vertical and lateral thinking, Brainstorming, Synectics, Group working dynamics. Monitoring changing scenario in economics, social, cultural and technological fields. Anticipation of new needs and aspirations.

9. Rapid Prototyping:

Introduction, techniques & application

References Books :

1. Design fundamentals (*R.G.Scott*)
2. Design methods inter science (*Jomes*)
3. Creative Engineering Design (*Buhl H. R.*)
4. The Science of Engineering Design (*Hill Percy H.*) Holt
5. Ergonomics (*Merilyn Joyce*) Ulrika Waller Steiner
6. Human factors in engineering & design, 4th edition
7. Human Engineering Guide & Equipment design (*Morgon C. T. & Others*)
8. Creativity (*Barron D. ed*) New York, Art Directors
9. Design for production (*Baldwin E. W. & Niebel B. W. Edwin*) Homewood Illinois

