

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE HH 8E1: PRODUCT DESIGN AND DEVELOPMENT

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical		
Product Design and Development DSE HH 8E1	4	2	0	2	Studied Semester 7	NIL

Learning Objectives

- Understand the basic concepts, scope and significance of product design.
- Develop creative and innovative thinking skills to design user-friendly, inclusive and interactive products.
- Gain knowledge of the New Product Development (NPD) process.
- Build skills for the successful promotion of the product in the market.

Learning Outcomes

- Provide students with an understanding of product design principles and real-world challenges.
- Encourage creativity and innovation for designing user-friendly and inclusive products.
- Providing insights regarding the New Product Development (NPD) process, from idea generation to market launch.
- Equip students with the skills to select materials, develop prototypes, and perform cost analysis for efficient design.

SYLLABUS OF DSE HP 8E1

THEORY
(Credits 2; Hours 30)

UNIT I: Introduction to Product Design

8 Hours

This unit covers the concept, scope, importance, approaches, and challenges of product design, along with success factors, design philosophies, and the role of product designers.

- Introduction to Product design: Concept, scope, importance and challenges
- Different approaches to Product design
- Factors for the success of products
- Design philosophies of famous designers

- Role of Product Designers

UNIT II: Creativity and Innovative thinking

6 Hours

This unit covers concept of creativity, innovation in product design, and human-centric design approaches like ergonomics, inclusive, and interactive design.

- Theories and models of creativity
- Techniques of developing creativity
- Role of innovation in product design
- Application of human factors and ergonomics (user-centric design, Inclusive design and Interactive design).

UNIT III: Product Development Process

10 Hours

This unit outlines the stages of new product development, including idea generation, material selection, prototyping, cost-value analysis, and legal aspects like intellectual property rights.

- Stages of New Product Development (NPD): Idea generation, concept development, market analysis, Feasibility study
- Detailed study of Materials
- Prototyping
- Cost-value Analysis for effective design
- Intellectual Property (IPR) and other legal considerations.

UNIT IV: Product Launch and Marketing

6 Hours

This unit highlights product launch strategies, including packaging, advertising, branding, post-launch review, and real-life case studies.

- Introducing the product to the market
- Packaging, Advertising and branding.
- Post-Launch Review and feedback for Improvements
- Real-Life Examples and Projects

PRACTICAL (Credits 2; Hours 60)

1. Case study of selected products-success and failure stories
2. Techniques of creativity
3. Study of selected materials: properties and functions
4. Design Tools and Software: CAD, graphic design tools, 3D printing etc.
5. Product-Life cycle mapping of any consumer product
6. Designing and Prototyping of a product (as per the stages of product development)
7. Simulation of Product Launch: Group activity for launching a product (pricing, promotional strategies and distribution channels)
8. Use of Technology in product design and development

Essential Readings

- Salvendy, G. (Ed.). (2021). *Handbook of human factors and ergonomics* (5th ed.). John Wiley & Sons, Inc.
- Petrov, V. (2019). *Theory of inventive problem solving: Level 1*. Springer Series.

- Ulrich, K. T., & Eppinger, S. D. (2019). *Product design and development* (7th ed.). McGraw-Hill Education.
- Sawyer, R. K. (2012). *Explaining creativity: The science of human innovation* (2nd ed.). Oxford University Press.
- Crawford, M. C., & Di Benedetto, C. A. (2011). *New products management* (11th ed.). McGraw-Hill Education.

Suggested Readings

- Sherman, B., & Bently, L. (2019). *The making of modern intellectual property law*. Cambridge University Press.
- Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson Education.
- W.S. Green & P.W. Jordan (Eds) (1999). *Human factors in product design: Current practice and future trends* (pp.206-217). London: Taylor & Francis.
- Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Bloomsbury Academic.
- Doren, Harold V. (1954). *Industrial Design – A Practical Guide to Product Design and Development*. New York: McGraw-Hill Book Company.

Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.