

BTME614-18 PRODUCT DESIGN AND DEVELOPMENT

The student will be able to:

1. Understand desirable design aspects considering various production processes and also understand the economic factors of design.
2. Employ engineering, scientific, and mathematical principles to execute a design from concept to finished product
3. Apply the modern approaches to product design considering concurrent design, quality function deployment and various rapid prototyping methods.
4. Apply innovative process techniques in synthesizing information, problem-solving and critical thinking.

Introduction to Product Design: Design by Evolution and Innovation, Essential factors of product design, Production consumption cycle, Flow and value addition in Production consumption cycle, The Morphology of Design, Primary design phases and flowcharting, Role of Allowances, process capability and tolerances in detailed design and assembly

Product Design and Industry: Product Strategies, Time to Market, Analysis of the Product, Standardization, Simplification and specialization, Basic design considerations, Role of Aesthetics in product design, Functional design practice

Design for Production: Producibility requirements in the design of machine components, Forging design, Pressed component design, Casting design for economical molding, eliminating defects and features to aid handling, Design for machining ease, the role of process Engineer, Ease of location and Clamping, Some additional aspects of production design, Design of powder metallurgical parts

Economic Factors Influencing Design: Product value, Design for safety, reliability and Environmental considerations, Manufacturing operations in relation to design, Economic analysis, profit and competitiveness, break even analysis,

Modern Approaches to product Design: Concurrent Design, Quality Function Deployment (QFD)

Rapid Prototyping: Principle of Rapid Prototyping, Rapid Prototyping Technologies (RPT), RPT in Industrial Design.

Books Recommended

1. Product Design and Development by Kail T Ulrich and Steven D Eppinger
2. Product Design and Development by AK Chitale and Gupta
3. Design of Systems and Devices by Middendorf Marcel Dekker