

**Syllabus for Stage-I screening test and Stage-II written subjective test: Faculty for
ME (Industrial Design)**

CREATIVE ENGINEERING DESIGN:

Creative design, Innovation versus invention, Globalization, Team work, Project scheduling and management.

Whole Brain thinking, Creativity, What makes an individual creative?

Mental Barriers, Types of mental Barriers.

Creative problems solving techniques.

Imagination, visualization, graphical representation and communication.

Design consideration and decisions.

Value, Global Economics Models, Costs, Revenue & Profits, Cost Breakdown of Products & Systems, Product Life Span, Time value of money.

Design for manufacturing and Design for assembly.

PRODUCT FORM AND AESTHETICS:

Elements and principles of design.

Principles of style in art, product design, architecture, and graphic design.

Types of 2D and 3D Visual Media, Visual Grammar, Application in Visual Design, Visual Perception and Analysis, Visual Forms & Concepts, Design.

Development of Form, Communication through Visual Modes of Application.

Studies in form and style, conceptualization, exploration, and development of form and style in both product design and Visual communication.

Bases for creative visualization: Fantasy. Metaphors, Cultural connotations and Bionics in the context of form-making.

Study of evolution of forms in products: 2D and 3D space analysis Dominant - sub dominant - subordinate relationships.

PRODUCT DESIGN AND DEVELOPMENT:

Design & its nature, Design activities, Design Ability, Intuition vs. logical thinking, Difference between Scientist/Engineer & a designer, Design problems.

Product development, Challenges of product development, Phases of product development process.

Product planning, Types of product development projects, Product Planning process.

Identifying Customer Needs, Product Specifications, Establishing target specifications, setting the final specifications, concept generation, a five-step method Concept Selection & Concept Testing.

Product Architecture, Industrial design.

Design for manufacturing & robust design.

Prototyping basics, Principles of prototyping, Rapid Prototyping technologies, planning for prototypes, applications of Rapid prototyping.

APPLIED ERGONOMICS:

Human Factors and Systems. Human Factors Research Methodologies.

Information Input and Processing.

Physical Work and Manual Materials Handling, Human Control of systems.

Workplace design: Applied Anthropometry, Work-space design and Seating, Arrangement of Components within a Physical Space, Interpersonal Aspects of Workplace Design.

Environmental conditions: Illumination, Climate, Noise, Motion.

Human Error, Accidents and Safety, Human Factors in Systems design.