



FACULTY OF ENGINEERING & TECHNOLOGY

First Year Master of Engineering

Semester II

Course Code: 102320208

Course Title: Product Design and Development

Type of Course: Program Elective IV

Course Objectives: The focus of Product Design and Development is integration of the marketing, design, and manufacturing functions of the firm in creating a new product with the basic concepts of product design and development process.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Internal		External		Total
				Theory	J/V/P*	Theory	J/V/P*	
3	0	2	4	30/15	20/10	70/35	30/15	150/75

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction: Importance of design, the design process, Considerations of Good Design, Morphology of Design, Duration and cost of product development, Challenges of product development, Designing to codes and standards, Product and process cycles, Forecasting, Market Identification, Competition Bench marking.	8
2	Development Processes and Organizations: A generic development process, concept development: the front-end process, adopting the generic product development process, the AMF development process, product development organizations, the AMF organization; Product planning process: Identify opportunities, Evaluate and prioritize projects, allocate resources and plan timing, complete pre project planning, reflect all the results and the process; Identifying Customer Needs: Gather raw data from customers, interpret raw data in terms of customer needs, organize the needs into a hierarchy, establish the relative importance of the needs and reflect on the results and the process; Product Specifications: What are specifications, when are specifications established, establishing target specifications, setting the final specifications.	12



3	Concept Generation, Selection and Testing: The activity of concept generation clarify the problem, search externally, search internally, explore systematically, reflect on the results and the process; Overview of selection methodology, concept screening, and concept scoring; Define the purpose of concept test, choose a survey population, choose a survey format, communicate the concept, measure customer response, interpret the result, reflect on the results and the process.	6
4	Product Architecture: What is product architecture, implications of the architecture, establishing the architecture, variety and supply chain considerations, platform planning, related system level design issues.	4
5	Industrial Design: Assessing the need for industrial design, the impact of industrial design, industrial design process, managing the industrial design process, assessing the quality of industrial design.	3
6	Prototyping: Prototyping basics, principles of prototyping, technologies, planning for prototypes.	3
7	Product Development Economics and Project Management: Elements of economic analysis, base case financial mode, Sensitive analysis, project trade-offs, influence of qualitative factors on project success, qualitative analysis; Understanding and representing task, baseline project planning, accelerating projects, project execution, post-mortem project evaluation.	3

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						R: Remembering; U: Understanding; A: Application, N: Analyze; E: Evaluate; C: Create
R	U	A	N	E	C	
25	25	15	20	15	5	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1	Product Design and Development, Ulrich K. T, and Eppinger S.D, McGraw Hill.
2	Product Design, Otto K, and Wood K, Pearson.
3	Engineering Design: A materials and Processing Approach, Dieter, G.E, McGraw Hill.
4	Product Design and Manufacturing - A C Chitale and R C Gupta, PHI.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Use a set of tools and methods for product design and development.	25
CO-2	Understand role of multiple functions in creating a new product.	25
CO-3	To coordinate multiple, interdisciplinary tasks in order to achieve a common objective.	25
CO-4	Enhanced team working skills.	25



List of Practicals / Tutorials:

1	To Understand Capacity and Capability of the existing facility of the college.
2	To identify the need of customer needs for a selected engineering product.
3	To set the specification of an engineering product.
4	Develop product architecture of an engineering product.
5	Establish the extent of producibility built into a given assembly and its components.
6	Study and understand the basics of Product Design and Development.
7	Study the Concept of Product Development process.
8	Understand the process of Product Concept Generation, Selection and Testing.
9	Product Prototyping and its need in practice.
10	To understand product Development Economics and Project Management concepts.

Supplementary learning Material:

1	NPTEL: https://nptel.ac.in/courses/112/107/112107217/#
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Curriculum Revision:

Version:	1
Drafted on (Month-Year):	Apr-20
Last Reviewed on (Month-Year):	Jul-20
Next Review on (Month-Year):	Apr-22