Devi Ahilya University, Indore, India Institute of Engineering & Technology				I Year M.E.(Industrial Engineering and Management) Full Time			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
IMR2E2 PRODUCT DESIGN & MANUFACTURING	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**1**	**3**	**1**	**1**	**5**
Duration of Theory Paper: 3 Hours							

Objectives & Pre requisites: To impart the basics of Product Design & Development of a new Product. To sharpen the skills of the students to understand the different manufacturing processes/ systems for new product development.

COURSE CONTENTS

UNIT -1

Introduction

Characteristics of successful product development, Design and development of products, duration and cost of product development, the challenges of product development. 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.

UNIT -2

Product Planning

The 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.

UNIT - 3

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.

UNIT - 4

Concept Generation

The activity of concept generation clarify the problem, search externally, search internally, explore systematically, and reflect on the results and the process. Concept Selection: Overview of methodology, concept screening, and concept scoring, Concept Testing: Define the purpose of concept test, choose a survey population, choose a survey format, communicate the concept, measure customer response, interpret the results.

UNIT – 5

Design for Manufacturing

Definition, estimation of manufacturing cost, reducing the cost of components, assembly, supporting production, impact of DFM on other factors. Prototyping: Prototyping basics, principles of prototyping, technologies, planning for prototypes. Product Development Economics: Elements of economic analysis, base case financial mode, Sensitive analysis, project trade-offs, influence of qualitative factors on project success, qualitative analysis.

BOOKS RECOMMENDED:

1. Ulrich Karl.T. & Eppinger Steven D., "Product Design and Development" Irwin McGrawHill- 3e, 2000.
2. Chitale A. C. and Gupta R. C., PH1, "Product Design and Manufacturing", 3e, 2003.
3. Timjones Butterworth Heinmann, "New Product Development" Oxford. UCI. 1997.
4. Boothroyd G., Dewhurst P. and Knight W., "Product Design forManufacture and Assembly",
   2002.

LABORATORY EXPERIMENTS:

(1) Case studies related to Characteristics of successful product development, Design and development of products.
(2) Case studies related to different Development Processes and Organizations.
(3) Case studies related to the product planning process, identify opportunities.
(4) Case studies related to Identifying Customer Needs.
(5) Case studies related to Concept Generation, Concept Selection, Concept Testing.
(6) Case studies related to Design for Manufacturing..
(7) Case studies related to Prototyping, Product Development Economics.