DEPARTMENT OF PRODUCTION TECHNOLOGY

MIT CAMPUS

ANNA UNIVERSITY: : CHENNAI – 600 044.

COURSE PLAN

COURSE DETAILS:

Degree	BE		
ProgrammeName	Production Engineering		
Course Code &Title	ME 5692 PRODUCT DESIGN AND PROCESS DEVELOPMENT		
Credits	3	**Session**	JAN 2024 – MAY 2024
Course Type	Program Core	**Section**	1
Name of the Faculty	Dr. J. Jancirani Professor Department of Production Technology, MIT Campus, Anna University, Chennai -44		

COURSE OBJECTIVES:

1. Applying the principles of generic development process; and understanding the organization structure for new product design and development.
2. Identifying opportunity and planning for new product design and development.
3. Conducting customer need analysis; and setting product specification for new product design and development.
4. Generating, selecting, and screening the concepts for new product design and development.
5. Testing and prototyping the concepts to design and develop new products.

UNIT I INTRODUCTION TO PRODUCT DESIGN & DEVELOPMENT 9

Introduction — Characteristics of Successful Product Development — People involved in Product Design and Development - Duration and Cost of Product Development - The Challenges of Product Development - The Product Development Process - Concept Development: The Front-End Process - Adapting the Generic Product Development Process - Product Development Process Flows - Product Development Organizations.

UNIT II OPPORTUNITY DENTIFICATION & PRODUCT PLANNING 9

Opportunity Identification: Definition - Types of Opportunities - Tournament Structure of Opportunity Identification - Effective Opportunity Tournaments — Opportunity dentification Process - Product Planning: Four Types of Product Development Projects - The Process of Product Planning

UNIT III IDENTIFYING CUSTOMER NEEDS & PRODUCT SPECIFICATIONS 9

Identifying Customer Needs: The Importance of Latent Needs - The Process of Identifying Customer Needs. Product Specifications: Definition - Time of Specifications Establishment - Establishing Target Specifications - Setting the Final Specifications

UNIT IV CONCEPT GENERATION & SELECTION **9**

Concept Generation: Activity of Concept Generation - Structured Approach - Five step method of Concept Generation. Concept Selection: Methodology - Concept Screening and Concepts Scoring.

UNIT V CONCEPT TESTING & PROTOTYPING **9**

Concept Testing: Seven Step activities of concept testing. Prototyping — Principles of Prototyping – Prototyping Technologies – Planning for Prototypes

45 PERIODS

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Apply the principles of generic development process; and understand the organization structure for new p1roduct design and development.
CO2: Identify opportunity and plan for new product design and development.
CO3: Conduct customer need analysis; and set product specification for new product design and development.
CO4: Generate, select, and screen the concepts for new product design and development.
CO5: Test and prototype the concepts to design and develop new products.

TEXT BOOKS :

1. Ulrich K.T., Eppinger S. D. and Anita Goyal, "Product Design and Development"McGraw-Hill Education; 7 edition,2020.

REFERENCES

1. Belz A., 36-Hour Course: "Product Development" McGraw-Hill,2010.
2. Rosenthal S., "Effective Product Design and Development", Business One Orwin, Home wood, 1992, ISBN 1-55623-603-4.
3. Stuart Pugh., "Total Design –Integrated Methods for Successful Product Engineering" Addison Wesley Publishing, 1991, ISBN 0-202-41639-5.
4. Chitale, A. K. and Gupta, R. C., Product Design and Manufacturing, PHI Learning, 2013.
5. Jamnia, A., Introduction to Product Design and Development for Engineers, CRC Press 2018.

COURSE ALIGNED PROGRAMME OUTCOMES (PO)

Upon completion of this course, the students will be able to:

1. Apply the principles of generic development process; and understand the organization structure for new p1roduct design and development.
2. Identify opportunity and plan for new product design and development.
3. Conduct customer need analysis; and set product specification for new product design and development.
4. Generate, select, and screen the concepts for new product design and development.
5. Test and prototype the concepts to design and develop new products.

COURSE TENTATIVE SCHEDULE / PLAN

Week	Day	Date	Hrs	Unit	Topics	Text Ref
1	THU	25.01.2024	5	UI	Introduction — Characteristics of Successful Product Development	T1,R
	FRI	26.01.2024	3,4		People involved in Product Design and Development - Duration and Cost of Product Development	T1
2	THU	01.02.2024	5		The Challenges of Product Development	T1
3	FRI	02.02.2024	3,4		The Product Development Process - Concept Development	T1
	THU	08.02.2024	5		The Front-End Process - Adapting the Generic Product Development Process	T1
4	FRI	09.02.2024	3,4		Product Development Process Flows - Product Development Organizations.	T1
	THU	15.02.2024	5	U II	Opportunity Identification: Definition - Types of Opportunities	T1
5	FRI	16.02.2024	3,4		Tournament Structure of Opportunity Identification	T1
	THU	22.02.2024	5		Effective Opportunity Tournaments — Opportunity dentification Process	T1
6	FRI	23.02.2024	3,4		Product Planning: Four Types of Product Development Projects	T1
	THU	29.02.2024	5		Product Planning: Four Types of Product Development Projects	T1
7	FRI	01.03.2024	3,4		The Process of Product Planning	T1
	THU	07.03.2024	5	U III	Identifying Customer Needs: The Importance of Latent Needs	T1
8	FRI	08.03.2024	3,4		The Process of Identifying Customer Needs	T1
	THU	14.03.2024	5		Product Specifications: Definition	T1
9	FRI	15.03.2024	3,4		Time of Specifications Establishment - Establishing Target Specifications	T1
	THU	21.03.2024	5		Time of Specifications Establishment - Establishing Target Specifications	T1
10	FRI	22.03.2024	3,4		Setting the Final Specifications	T1
	THU	28.03.2024	5		Concept Generation: Activity of Concept Generation	T1
11	FRI	29.03.2024	3,4		Concept Generation: Activity of Concept Generation	T1

	THU	04.04.2024	5	U IV	- Structured Approach - Five step method of Concept Generation	T1
12	FRI	05.04.2024	3,4		- Structured Approach - Five step method of Concept Generation	T1
13	THU	11.04.2024	5		Concept Selection: Methodology	T1
	FRI	12.04.2024	3,4		Concept Selection: Methodology	T1
	THU	18.04.2024	5	U V	Concept Testing: Seven Step activities of concept testing	T2
	FRI	19.04.2024	3,4		Concept Testing: Seven Step activities of concept testing	T2
15	THU	25.04.2024	5		Prototyping — Principles of Prototyping	
	FRI	26.04.2024	3,4		Prototyping — Principles of Prototyping	T2
16	THU	02.05.2024	5		Prototyping Technologies	T2
	FRI	03.05.2024	3,4		Planning for Prototypes	T2

COURSE DELIVERY/INSTRUCTIONAL METHODOLOGIES:

✓Chalk & Talk	✓ Stud. Assignments	✓Web Resources
✓ LCD/~~Smartboards~~	✓ Stud. Seminars	☐ Add-On Courses

COURSE ASSESSMENT METHODOLOGIES-DIRECT

✓ University (End Semester) Examination		✓Internal Assessment Tests	
✓ Assignments	✓ Laboratory Practices	✓ Mini/Major Projects	✓Stud. Seminars
☐ Viva Voce	☐ Certifications	☐ Add-On Courses	☐ Others

COURSE ASSESSMENT METHODS

S.N.	Mode of Assessment	Test		Date	Duration		W
1.	Continuous Assessment Theory (25%)	Assessment Test 1			1½ hr		
		Assessment Test 2			1½ hr		
2.	Continuous Assessment Laboratory (Total 25%)	Experiment and Midterm Test			3 hr		
3.	End Semester Examination (50%)	Theory (25%)	Laboratory (25%)		3 hr	3 hr	

COURSE ASSESSMENT METHODOLOGIES-INDIRECT

✓ Assessment of CO (By Feedback, Once)	✓ Student Feedback On Faculty (Once)
☐ Assessment of Mini/Major projects by Ext. Experts	☐ Others

COURSE (EXTRA) ESSENTIAL READINGS:

Will be provided to the students during the class hours.

1. https://onlinecourses.nptel.ac.in/noc21_me83/preview
2. https://www.shiksha.com/online-courses/product-design-and-development-course-nptel789

COURSE EXIT SURVEY (will be collected at end of the course)

The purpose of this survey is to find out from students about their learning experiences and their thoughts about the course.

Rating	1: Slight (Low)	2: Moderate (Medium)	3: Substantial (High
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE POLICY (Compensation Assessment)

1. Attending all the assessment is mandatory for every student
2. Course policy will be followed as per the academic course regulation

COURSE ACADEMIC DISHONESTY AND PLAGIARISM

1. All rules and regulation prescribed by the ACOE, University Departments, are applicabl in the Internal Assessment Tests and University (End Semester) Examinations (https://acoe.annauniv.edu/download_forms/student_forms/Guidelines.pdf)
2. In general, possessing a mobile phone, carrying bits of paper with materials, talking t other students, copying from other students during Internal Assessment Tests an University (End Semester) Examinations will be treated as Malpractice and punishabl as per the rules and regulations. The misuse of Assignment / Project / Seminar works fron others is considered as academic dishonesty and will be treated with the rules an regulations of the University.

COURSE ADDITIONAL INFORMATION

Queries / clarifications / discussion (if required) may be e-mailed to / contact the course instructors during their Office Hours.

For Approval

Course Faculty

Course Coordinator

Professor In Charge

Head of the Department