

CMR Institute of Technology, Bangalore			
Department(s): Mechanical Engineering			
Semester: 8	Section(s): A&B	Lectures/week: 04	
Subject: Product Life Cycle Management		Code: 17ME835	
Course Instructor(s): Dr Gopi S			
Course duration: 1 April 2022 – 30 July 2022			
Course Site:			

Course Objectives

- ☐ To understand concepts involved in product design and manufacturing.
- ☐ Understand concepts of product design and simulations.
- ☐ Develop new product development strategies and supporting structures.
- ☐ Interpret technology forecasting, product innovation and business development.

Prerequisites

- ☐ Basics of Financial Management, Product design and development

Lesson Plan				
Lecture #	Book & Sections	Topics	Portions coverage	
			Teaching Aids	% of Syllabus Covered
01-10	TB1: 2.1-2.5	Introduction to plcm, Needs and objectives of plcm, benefits and different views of plcm, phases of plcm, strategies of plcm, selection and product data management.	Chalk and Talk	10
Links to some useful online lectures:  https://www.youtube.com/watch?v=nfKZ_mFZOVA				
11-20	TB1:3.1-3.25	Product design, decomposition in product design, methodical evolution in product design, concurrent engineering, design for 'X'. strategies for recovery at end of life. recycling, human factors in product design.	Chalk and Talk Video Lectures for some topics	10

Links to some useful online lectures: ☐ https://www.youtube.com/watch?v=ekVereJE1ZI				
21-30	TB1: 4.1-4.21	New product development and structuring new product development, building decision support system, estimating market opportunities for new product, market entry decision, launching and tracking new product. Concept of redesign of product.	Chalk and Talk	20
Links to some useful online lectures: ☐ https://www.youtube.com/watch?v=ekVereJE1ZI				
31-40	TB1: 5.1-5.18	Technological changes, methods of technology forecasting, relevance tree, morphological methods flow diagram and combining forecasting of technologies. Integration of product design and product development.	Chalk and Talk Video Lectures for some topics	20
Links to some useful online lectures: ☐ https://www.youtube.com/watch?v=ob5KWs3I3aY				
41-45	TB1:6.1-6.24	Methods of tools in the innovation process according to situation, virtual product development tool for components, machines and manufacturing plants, 3D cad systems and digital mock up, model building and model analysis. product structure and variant management, product configuration.	Chalk and Talk	20
Links to some useful online lectures: ☐ https://www.youtube.com/watch?v=ekVereJE1ZI				
45-50	TB1-7.1-7.18	Material master data, product description data. Data models, life cycles of individual items, product data technology.	Chalk and Talk	20
Links to some useful online lectures: ☐ https://www.youtube.com/watch?v=ekVereJE1ZI				

Text Books

1.	Stark John, product life cycle management for 21 st century product realization, springer-verlag.
2.	Fabio Giudice, guido la Rose, product design for environment, A life cycle approach, Taylor and Francis 2006.
Reference Books	
1.	Riggs, Management Approach 5 th edition, Tata McGraw-Hill,ISBN 9780070634986

Syllabus for Internal Assessment Tests (IAT^{*})

IAT #	Syllabus
IAT-1	Class # 01 – 16
IAT-2	Class # 17 – 34
IAT-3	Class # 35 – 50

*See calendar of events for IAT schedule.

Course Outcomes
By the end of this course, students will be able to
1. Explain various strategies of plcm.
2. Describe decomposition of product design and model simulation.
3. Apply concepts of new product development and its structuring.
4. Apply virtual product development and model Analysis.

**Based on table 01, 02, 03 in appendix, following are the Course outcomes.

Course Outcomes		Modu les cover ed	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO1	various strategies of plcm.	1&4	1	-	2	1	1	2	1	-	1	-	-	1	1	2	1	-
CO2	Describe decomposition of product design and model simulation.	1	1	-	1	-	1	1	-	-	-	-	-	1	1	-	1	-
CO3	Apply concepts of new product development and its structuring.	5	-	2	-	-	2	-	-	-	-	-	-	2	1	-	1	-
CO4	Apply virtual product development and model Analysis.	2 & 3	-	-	-	-	1	-	-	-	-	-	-	-	1	-	1	-

Note: Assignments, study material, Question bank and other course related content would be posted on site mentioned in course site, mentioned in first page.

Signature with date:	Course Instructor	Program Coordinator	Head-ME
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Appendix

Table 01: Cognitive Levels

Cognitive Levels	
Cognitive level	Revised Blooms Taxonomy Keywords

L1	List, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
L2	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
L3	Apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover.
L4	Analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer.
L5	Assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize.

Table 02: Program Outcomes (PO) and Program Specific Outcomes (PSO)

Program Outcomes (PO), Program Specific Outcomes (PSO)	
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PSO1	Design, implement and maintain business applications in a variety of languages using libraries and frameworks.
PSO2	Develop and simulate wired and wireless network protocols for various network applications using modern tools.

PSO3	Apply the knowledge of software and design of hardware to develop embedded systems for real world applications.
PSO4	Apply knowledge of web programming and design to develop web based applications using database and other technologies

Table 03: Correlation Levels

Correlation Levels	
0	No Correlation
1	Slight/Low
2	Moderate/ Medium
3	Substantial/ High