Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY

COURSE PLAN

Academic Year 2019 –2020

Program:	B E – MECHANICAL
Semester :	VIII
Course Code:	15ME835
Course Title:	PRODUCT LIFE CYCLE MANAGEMENT
Credit / L-T-P:	3 / 4-0-0
Total Contact Hours:	40
Course Plan Author:	DINESH P

Academic Evaluation and Monitoring Cell

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Table of Contents

Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

15ME835:PRODUCT LIFE CYCLE MANAGEMENT

A. COURSE INFORMATION

1. Course Overview

Degree:	BE	Program:	ME
Year / Semester :	4/VIII	Academic Year:	2019-2020
Course Title:	PRODUCT LIFE CYCLE MANAGEMENT	Course Code:	15ME835
Credit / L-T-P:	3/4-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	40	SEE Marks:	80Marks
CIA Marks:	20	Assignment	1 / Module
Course Plan Author:	DINESH P	Sign	Dt:
Checked By:		Sign	Dt:

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	**INTRODUCTION TO PLM AND PDM:**Introduction to PLM,Need for PLM,opportunities and benefits of PLM, different views of PLM, components of PLM, phases of PLM, PLM feasibility study. PLM Strategies, strategy elements, its identification, selection and implementation. Product Data Management, implementation of PDM systems.	8 (4,4)	-Product Life cycle model -Product Data	L2
2	**PRODUCT DESIGN:** Engineering design, organization and decomposition in product design, product design process, methodical evolution in product design, concurrent engineering, design for 'X' and design central development model. Strategies for recovery at end of life, recycling, human factors in product design. Modelling and simulation in product	8 (4,4)	-Product design and Planning -selection techniques for PDM	L2
3	**PRODUCT DEVELOPMENT:** New Product Development, Structuring new product development, building decision support system, Estimating market opportunities for new product, new product financial control, implementing new product development, market entry decision, launching and tracking new product program. Concept of redesign of product.	8 (4,4)	-Production Control techniques -new product Building	L2
4	**TECHNOLOGY FORECASTING:** Technological change, methods of technology forecasting, relevance trees, morphological methods, flow diagram and combining forecast of technologies Integration of technological product innovation and product development in business processes within enterprises, methods and tools in the innovation process according to the situation, methods and tools in the innovation process according to the situation.	8 (4,4)	-development approaches -Methods and tools of Forecasting	L2
5	**PRODUCT BUILDING AND STRUCTURES:** Virtual product development tools for components, machines, and manufacturing plants: 3D CAD systems, digital mock-up, model building, model analysis, production (process) 16planning, and product data technology, Product structures: Variant management, product configuration, material master data, product description data, Data models, Life cycles of individual items, status of items.	8 (4,4)	- Product configurations -Product Structure	L2

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).
1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Module	Details	Available
A	**Text books (Title, Authors, Edition, Publisher, Year.)**	
1,2,3,4,5	Product Life Cycle Management by Kestoor Praveen	In Lib,In Dept
B	**Reference books (Title, Authors, Edition, Publisher, Year.)**	
1,2,3,4,5	Product Life Cycle Management and Innovation by McGraw Hill	In Lib
C	**Concept Videos or Simulation for Understanding**	
C1	PLCM life cycle model https://www.youtube.com/watch?v=ePZheUvsH0w-	
C2	PDM working https://www.youtube.com/watch?v=HgDfCFkBAxM-	
C3	Process of product design https://www.youtube.com/watch?v=CnKeVs-_9zs-	
C4	Decomposition in Product Design https://www.youtube.com/watch?v=A0-vPJ0ad-44-	
C5	Product Development https://www.youtube.com/watch?v=w2m5eU8XDVI	
D	**Software Tools for Design**	
	PLM software for manufacturing https://www.plm.automation.s	

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.
Students must have learnt the following Courses / Topics with described Content . . .

SNo	Course Code	Course Name	Module / Topic / Description	Sem	Remarks	Blooms Level
1	-	-	Product life cycle and simulation		Gap Workshop on Product development model	L2
2	15ME51	Management and Entrepreneurship	Product Planning and Decision making	5	-	L2

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.
Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level
1	PLM and PDM	Higher Study	Gap A seminar on PLCM model	Understand L2

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

#	Cos students should be able to...	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
15ME835.1	Understand the various strategies of PLM and Product Data Management	08	Product Life cycle model	Lecture/ Tutorial	Assignment	L2 Understand
15ME835.2	Understand the description of decomposition of product design and model simulation	04	Product design and Planning	Lecture/ Tutorial	Assignment	L2 Understand
15ME835.3	Understand a concept of structure of the new product to build	04	new product Building	Lecture/ Tutorial	Assignment	L2 Understand
15ME835.4	Understand different methods and tools of Forecasting innovations	04	Methods and tools of Forecasting	Lecture/ Tutorial	Assignment	L2 Understand
15ME835.5	Understand the product configurations to build new product and model analysis	04	Product configurations and structure	Lecture/ Tutorial	Assignment	L2 Understand

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

Write 1 or 2 applications per CO.
Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	Reduced cycle time -- ensures on-schedule product launches and first-mover market Improved quality -- boosts brand value and customer loyalty, and enables premium pricing	CO1	L2
2	Increased efficiency and process optimization -- drives team productivity and enhances breadth of portfolio Improved regulatory compliance for market segments such as consumer products -- ensures adherence to mandates such as REACH and the Consumer Products Safety	CO2	L2
3	Reduced direct material cost -- improves margins and profit contribution PTC - High Performance PLM	CO3	L2
4	Those needs have to be resolve by the PLM systems to interest the mechanical SMEs. Decision aid indicators: the cost is the indicator the most asked, to choice between alternative products for the equipments manufacturers or to choice between alternative operations in a routing for the raw parts manufacturers.	CO4	L2
5	Collaboration of exchange with the customers (for the parts and components manufacturers) and with the suppliers (for the components and equipments manufacturers) must be facilitated and standardized, especially for the CAD files exchanges. Multiple views: the information has to be visible with the structure and the names of each department. It is particularly need for the BoM in design and production departments, corresponding to the structures of the CAD and the ERP.	CO5	L2

4. Mapping Justification

Mapping		Justification	Mapping Level
CO	**PO**	**-**	**-**
CO1	PO1	Engineering Knowledge: Acquisition of Engineering knowledge on fundamentals of Product life cycle is essential to accomplish solutions to complex engineering problems in management and fundamentals of process planning	L2
CO1	PO11	Demonstrate knowledge and understanding of the engineering management principles for product life cycle and	L2
CO2	PO1	Engineering Knowledge: Acquisition of Engineering knowledge on fundamentals of Product life cycle is essential to accomplish solutions to complex engineering problems in management simulating a product and development of new product	L2
CO2	PO11	Demonstrate knowledge and understanding of the engineering management principles for the simulation of products and development of new product	L2
CO3	PO1	Engineering Knowledge: Acquisition of Engineering knowledge on fundamentals of Product life cycle is essential to accomplish solutions to complex engineering problems in management learn about structure of new product and the concept of product development approaches	L2
CO3	PO11	Demonstrate knowledge and understanding of the engineering management principles for product Structural data of new product development and product design data of new product development.	L2
CO4	PO1	Engineering Knowledge: Acquisition of Engineering knowledge on fundamentals of Product life cycle is essential to accomplish solutions to complex engineering problems in management Knowledge of tools of production in forecasting and management of different configuration to build a new product	L2
CO4	PO11	Demonstrate knowledge and understanding of the engineering management principles for product life cycle Different tooling innovations to build a product and product implementation by various approaches of product manufacturing.	L2
CO5	PO1	Engineering Knowledge: Acquisition of Engineering knowledge on fundamentals of Product life cycle is essential to accomplish solutions to complex engineering problems in management to build new product by product configurations and management to analyze the product structure	L2
CO5	PO11	Demonstrate knowledge and understanding of the engineering management principles to build new product by Collecting the data about the product configurations and principles for product build to Collection the data about the product structure	L2

4. Articulation Matrix

(CO – PO MAPPING)

-	-	Course Outcomes	Program Outcomes															
Modules	#	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	Level
1	15ME835.1	Understand field of Product Life cycle model and Product data management	**2**	-	-	-	-	-	-	-	-	-	**2**	-	-	-	-	L2
2	15ME835.2	Understand the process of planning and design of product model and simulation in PDM	**2**	-	-	-	-	-	-	-	-	-	**2**	-	-	-	-	L2

3	15ME835.3	Understand concept of new product development and structure of the new product	**2**	-	-	-	-	-	-	-	-	-	**2**	-	-	-	-	L2
4	15ME835.4	Understand techniques of product development approaches and different methods of innovating product tools	**2**	-	-	-	-	-	-	-	-	-	**2**	-	-	-	-	L2
5	15ME835.5	Understand the product configurations to build new product and the analysis of product structure	**2**	-	-	-	-	-	-	-	-	-	**2**	-	-	-	-	L2
-	15ME835	**Average attainment (1, 2, or 3)**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	-	-	-
-	*PO, PSO*	*1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design*																	

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1	Product life cycle and simulation	Seminar	2nd week / date	-	-

6. Content Beyond Syllabus

Modules	Gap Topic	Area	Actions Planned	Schedule Planned	Resources Person	PO Mapping
3	Product development and ergonomics	Placement, GATE, Higher Study, Entrepreneurship.	Presentation by students & Mini Project	3rd week / date	Dr ABC, Inst. Self	List from B4 above

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Module #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		

1	PLM and PDM	8	2	-	-	1	1	2	CO1	L2
2	Product design and simulation	8	2	-	-	1	1	2	CO2	L2
3	Product structure and development	8	-	2	-	1	1	2	CO3	L2
4	Forecasting and product innovation	8	-	2	-	1	1	2	CO4	L2
5	Product configuration	8	-	-	4	1	1	2	CO5	L2
-	**Total**	**40**	**4**	**4**	**4**	**5**	**5**	**10**	**-**	**-**

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	15	CO1, CO2	L2
CIA Exam – 2	15	CO3, CO4	L2
CIA Exam – 3	15	C05	L2
Assignment - 1	05	CO1, CO2	L2
Assignment - 2	05	CO3, CO4	L2
Assignment - 3	05	C05	L2
Seminar - 1	–	–	–
Seminar - 2	–	–	–
Seminar - 3	–	–	–
Other Activities define – Slip test			
Final CIA Marks	**20**	**-**	**-**

D1. TEACHING PLAN - 1

Module - 1

Title:	Introduction To PLM And PDM	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand field of management and the process of product planning	CO1	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	Introduction to PLM,Need for PLM	C01	L2
2	Scope and Functional areas of management	C01	L2
3	opportunities and benefits of PLM	C01	L2
4	different views of PLM, components of PLM, phases of PLM,	C01	L2
5	PLM feasibility study. PLM Strategies,	C01	L2
6	Strategy elements, its identification,	C01	L2
7	selection and implementation. Product Data Management,	C01	L2
8	implementation of PDM systems.	C01	L2
c	**Application Areas**	**CO**	**Level**
1	Organization	CO1	L2
2	Planning department	CO1	L2
d	**Review Questions**	-	
1	Define PLC management, explain the levels of PLCM?	CO1	L2

2	Explain in details the Phases of PLCM?	CO1	L2
3	What are the characteristics of PLCM? Explain.	CO1	L2
4	Explain the components of PLCM?	CO1	L2
5	Explain the implementation of PLCM?	CO1	L2
6	Explain Product data management ?	CO1	L2
7	Explain the strategies of PLCM?	CO1	L2
8	Explain the implementation of Product data management?	CO1	L2
9	Explain the needs of PLCM?	CO1	L2
10	Explain the Benefits of PLCM?	CO1	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 2

Title:	Product Design	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand the process of planning and design of product model and and simulation in PDM	CO2	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	**PRODUCT DESIGN:** Introduction	CO2	L2
2	Engineering design and organization	CO2	L2
3	decomposition in product design, product design process	CO2	L2
4	methodical evolution in product design, concurrent engineering	CO2	L2
5	design for 'X' and design central development model	CO2	L2
6	Strategies for recovery at end of life, recycling	CO2	L2
7	Strategies for recovery at human factors in product design	CO2	L2
8	Modeling and simulation in product	CO2	L2
c	**Application Areas**	**CO**	**Level**
1	Production	CO2	L2
2	Human resources	CO2	L2
d	**Review Questions**	-	-
1	What is an product design? Explain.	CO2	L2
2	Briefly explain the principles of product design process?	CO2	L2
3	Explain the process of decomposition in product design	CO2	L2
4	Explain steps involved in product modeling?	CO2	L2
5	Explain steps involved in design for X?	CO2	L2
6	Explain the importance of human factors in product design?	CO2	L2
7	Explain the techniques of product simulation?	CO2	L2
8	Explain the characteristics of design central development model?	CO2	L2
9	explain the principles of Engineering design and organization ?	CO2	L2
10	Explain the methods of concurrent engineering?	CO2	L2

e	**Experiences**	-	-
1			
2			
3			
4			
5			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	15ME835	Sem:	VIII	Marks:	15	Time:	75 minutes		
Course:	Product Life Cycle Management								
-	**-**	**Note: Answer any 2 questions, each carry equal marks.**					**Marks**	**CO**	**Level**
1	a	Explain in details the functions of PLCM?					5	CO1	L2
	b	Explain the characteristics of product date management?					5	CO1	L2
	c	Explain the benefits of PLM?					5	CO1	L2
		OR							L2
2	a	Explain the implementation of Product data management?					5	CO1	L2
	b	Explain the needs of PLCM?					5	CO1	L2
	c	Explain the Benefits of PLCM?					5	CO1	L2
3	a	Briefly explain the principles of product design process?					5	CO2	L2
	b	Explain the process of decomposition in product design?					5	CO2	L2
	c	Explain steps involved in product modeling?					5	CO2	L2
		OR							
4	a	Explain the techniques of product simulation?					5	CO2	L2
	b	Explain the characteristics of design central development model?					5	CO2	L2
	c	explain the principles of Engineering design and organization ?					5	CO2	L2

b. Assignment -1

Model Assignment Questions									
Crs Code:	15ME835	Sem:	VIII	Marks:	5	Time:	90 – 120 minutes		
Course:	Product Life Cycle Management								
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.									
SNo	**USN**	**Assignment Description**					**Marks**	**CO**	**Level**
1		Define PLC management, explain the levels of PLCM?					5	CO1	L2
2		Explain in details the Phases of PLCM?					5	CO1	L2
3		What are the characteristics of PLCM? Explain.					5	CO1	L2
4		Explain the components of PLCM?					5	CO1	L2
5		Explain the implementation of PLCM?					5	CO1	L2
6		Explain Product data management ?					5	CO1	L2
7		Explain the strategies of PLCM?					5	CO1	L2
8		Explain the implementation of Product data management?					5	CO1	L2
9		Explain the needs of PLCM?					5	CO1	L2
10		Explain the Benefits of PLCM?					5	CO1	L2
11		What is an product design? Explain.					5	CO1	L2
12		Briefly explain the principles of product design process?					5	CO1	L2
13		Explain the process of decomposition in product design					5	CO2	L2
14		Explain steps involved in product modeling?					5	CO2	L2
15		Explain steps involved in design for X?					5	CO2	L2

16		Explain the importance of human factors in product design?	5	CO2	L2
17		Explain the techniques of product simulation?	5	CO2	L2
18		Explain the characteristics of design central development model?	5	CO2	L2
19		explain the principles of Engineering design and organization ?	5	CO2	L2
20		Explain the methods of concurrent engineering?	5	CO2	L2

D2. TEACHING PLAN - 2

Module – 3

Title:	Product Development	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand concept of new product development and structure of the new product	CO3	L2
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**PRODUCT DEVELOPMENT:** introduction.	CO3	L2
2	New Product Development, Structuring new product development.	CO3	L2
3	building decision support system.	CO3	L2
4	Estimating market opportunities for new product.	CO3	L2
5	new product financial control, implementing new product development.	CO3	L2
6	market entry decision, launching and tracking new product program.	CO3	L2
7	Concept of redesign of product.	CO3	L2
8	Analysis of product development.	CO3	L2
c	**Application Areas**	**CO**	**Level**
1	Production	CO3	L2
2	Financial aspects	CO3	L2
d	**Review Questions**	-	-
1	Define product development, explain the levels of product development?	CO3	L2
2	Explain in details the product development?	CO3	L2
3	Explain steps involved in design for X?	CO3	L2
4	Explain the importance of human factors in product design?	CO3	L2
5	Explain in brief building decision support system?	CO3	L2
6	Explain the Analysis of product development.	CO3	L2
7	What are the market opportunities for new product? Explain.	CO3	L2
8	Explain the concept of implementation of new product development ?	CO3	L2
9	Explain the Concept of redesign of product?	CO3	L2
10	Explain the Concept of launching and tracking new product program?	CO3	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 4

Title:	Technology Forecasting	Appr	8 Hrs

		Time:	
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand techniques of product development approaches and different methods of innovating product tools	CO4	L2
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**TECHNOLOGY FORECASTING:** Introduction	CO4	L2
2	Technological change, methods of technology forecasting	CO4	L2
3	relevance trees, morphological methods	CO4	L2
4	product development in business processes within enterprises	CO4	L2
5	flow diagram and combining forecast of technologies Integration of technological	CO4	L2
6	product innovation	CO4	L2
7	methods and tools in the innovation process according to the situation	CO4	L2
8	methods and tools in the innovation process according to the situation	CO4	L2
c	**Application Areas**	**CO**	**Level**
1	Forecasting	CO4	L2
2	Business process	CO4	L2
d	**Review Questions**	-	-
1	Explain the importance of technological forecasting ?	CO4	L2
2	Explain the methods of technological forecasting?	CO4	L2
3	Explain the concept of morphological methods?	CO4	L2
4	Explain the principles of relevance trees and flow diagrams?	CO4	L2
5	Explain the concept of integration of innovation technologies for product development?	CO4	L2
6	Explain the importance of forecast technologies?	CO4	L2
7	Explain the techniques of product development in business processes within organization?	CO4	L2
8	Explain the methods and tools of innovation process?	CO4	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	15ME835	Sem:	VIII	Marks:	15	Time:	75 minutes		
Course:	Product Life Cycle Management								
-	**-**	**Note: Answer any 2 questions, each carry equal marks.**					**Marks**	**CO**	**Level**
1	a	Explain in details the product development?					5	CO3	L2
	b	What are the strategies of product development? Explain.					5	CO3	L2
	c	Explain the process of Structuring new product development?					5	CO3	L2
2	a	What are the market opportunities for new product? Explain.					5	CO3	L2
	b	Explain the concept of implementation of new product development ?					5	CO3	L2
	c	Explain the Concept of redesign of product?					5	CO3	L2
3	a	Explain the methods of technological forecasting?					5	CO4	L2

	b	Explain the concept of morphological methods?	5	CO4	L2
	c	Explain the principles of relevance trees and flow diagrams?	5	CO4	L2
4	a	Explain the importance of forecast technologies?	5	CO4	L2
	b	Explain the techniques of product development in business processes within organization?	5	CO4	L2
	c	Explain the methods and tools of innovation process?	5	CO4	L2

b. Assignment – 2

Model Assignment Questions							
Crs Code:	15ME835	Sem:	VIII	Marks:	5	Time:	90 – 120 minutes
Course:	Product Life Cycle Management						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		Define product development, explain the levels of product development?	5	CO3	L2
2		Explain in details the product development?	5	CO3	L2
3		What are the strategies of product development? Explain.	5	CO3	L2
4		Explain the process of Structuring new product development?	5	CO3	L2
5		Explain in brief building decision support system?	5	CO3	L2
6		Explain the Analysis of product development.	5	CO3	L2
7		What are the market opportunities for new product? Explain.	5	CO3	L2
8		Explain the concept of implementation of new product development ?	5	CO3	L2
9		Explain the Concept of redesign of product?	5	CO3	L2
10		Explain the Concept of launching and tracking new product program?	5	CO3	L2
11		Explain the methods of Structuring new product development?	5	CO3	L2
12		Explain in brief decision support system?	5	CO3	L2
13		Explain the importance of technological forecasting ?	5	CO4	L2
14		Explain the methods of technological forecasting?	5	CO4	L2
15		Explain the concept of morphological methods?	5	CO4	L2
16		Explain the principles of relevance trees and flow diagrams?	5	CO4	L2
17		Explain the concept of integration of innovation technologies for product development?	5	CO4	L2
18		Explain the importance of forecast technologies?	5	CO4	L2
19		Explain the techniques of product development in business processes within organization?	5	CO4	L2
20		Explain the methods and tools of innovation process?	5	CO4	L2

D3. TEACHING PLAN - 3

Module – 5

Title:	Product Building And Structures	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand the product configurations to build new product and analysis of product structure	CO5	L2

b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
1	**PRODUCT BUILDING AND STRUCTURES:** Introduction	CO5	L2
2	Virtual product development tools for components	CO5	L2
3	machines, and manufacturing plants: 3D CAD systems	CO5	L2
4	digital mock-up, model building, model analysis	CO5	L2
5	production (process) planning, and product data technology	CO5	L2
6	Product structures Variant management, product configuration	CO5	L2
7	material master data, product description data	CO5	L2
8	Data models, Life cycles of individual items, status of items.	CO5	L2
c	**Application Areas**		
1	CNC Tooling	CO5	L2
2	Life cycle models	CO5	L2
d	**Review Questions**		L2
1	Explain the concept of product structures?	CO5	L2
2	What is Virtual product development tool? Explain its components.	CO5	L2
3	Explain the process of 3D CAD systems?	CO5	L2
4	Explain in brief building decision support system?	CO5	L2
5	Explain the Concept of model building and model analysis?	CO5	L2
6	What is digital mock-up ? Explain	CO5	L2
7	Explain production planning in brief?	CO5	L2
8	Explain the Concept of product data technology?	CO5	L2
9	Explain the product configuration ?	CO5	L2
10	Explain the following. 1) material master data 2) product description data	CO5	L2
11	Explain in brief Data models?	CO5	L2
12	Explain the concept of Life cycles of individual items ?	CO5	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	15ME835	Sem:	VIII	Marks:	15	Time:	75 minutes
Course:	Product Life Cycle Management						

-	-	**Note: Answer any 2 questions, each carry equal marks.**	**Marks**	**CO**	**Level**
1	a	Explain the concept of product structures?	7	CO5	L2
	b	What is Virtual product development tool? Explain its components.	8	CO5	L2
		OR			
2	a	Explain in brief building decision support system?	7	CO5	L2
	b	Explain the Concept of model building and model analysis?	8	CO5	L2
3	a	What is digital mock-up ? Explain	7	CO5	L2
	b	Explain production planning in brief?	8	CO5	L2
		OR			
4	a	Explain the following. 1) material master data 2) product description data	8	CO5	L2
	b	Explain the concept of Life cycles of individual items ?	7	CO5	L2

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions

Crs Code:	15ME835	Sem:	VIII	Marks:	5	Time:	90 – 120 minutes
Course:	Product Life Cycle Management						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		Explain the Concept of model building and model analysis?	5	CO5	L2
2		Explain in brief building decision support system?	5	CO5	L2
3		Explain the concept of product structures?	5	CO5	L2
4		What is Virtual product development tool? Explain its components.	5	CO5	L2
5		Explain the deferent components of product structures?	5	CO5	L2
6		Explain the process of 3D CAD systems?	5	CO5	L2
7		What is digital mock-up ? Explain	5	CO5	L2
8		Explain production planning in brief?	5	CO5	L2
9		Explain the Concept of product data technology?	5	CO5	L2
10		Explain the product configuration ?	5	CO5	L2
11		Explain the following. 1) material master data 2) product description data	5	CO5	L2
12		Explain in brief Data models?	5	CO5	L2
13		Explain the concept of Life cycles of individual items ?	5	CO5	L2
14					

F. EXAM PREPARATION

1. University Model Question Paper

Course:	Product Life Cycle Management					Month / Year	May /2018
Crs Code:	15ME835	Sem:	VIII	Marks:	80	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	Marks	CO	Level
1	a	Explain the strategies of PLCM?	8	CO1	L2
	b	Explain the needs of PLCM?	8	CO1	L2
		OR			
	a	Explain Product data management ?	8	CO1	L2
	b	Explain the implementation of Product data management?	8	CO1	L2
2	a	Briefly explain the principles of product design process?	8	CO2	L2
	b	Explain the process of decomposition in product design	8	CO2	L2
		OR			
	a	Explain the characteristics of design central development model?	8	CO2	L2
	b	explain the principles of Engineering design and organization ?	8	CO2	L2
3	a	What are the strategies of product development? Explain.	8	CO3	L2
	b	Explain the process of Structuring new product development?	8	CO3	L2
		OR			
	a	What are the market opportunities for new product? Explain.	8	CO3	L2
	b	Explain the concept of implementation of new product development ?	8	CO3	L2
4	a	Explain the principles of relevance trees and flow diagrams?	8	CO4	L2
	b	Explain the concept of integration of innovation technologies for product development?	8	CO4	L2
		OR			
	a	Explain the methods and tools of innovation process?	8	CO4	L2
	b	Explain the techniques of product development in business processes within organization?	8	CO4	L2
5	a	Explain the process of 3D CAD systems?	8	CO5	L2
	b	Explain in brief building decision support system?	8	CO5	L2
	a	Explain the product configuration ?	8	CO5	L2

	b	Explain the following. 1) material master data 2) product description data	8	CO5	L2

2. SEE Important Questions

Course:		Product Life Cycle Management					Month / Year	May /2018	
Crs Code:		15ME835	Sem:	VIII	Marks:	80	Time:	180 minutes	
	Note	Answer all FIVE full questions. All questions carry equal marks.					-	-	
Module	Qno.	Important Question					**Marks**	**CO**	**Year**
1	1	Explain the strategies of PLCM?					8	CO1	2018
	2	Explain the needs of PLCM?					8	CO1	2018
	3	Define PLC management, explain the levels of PLCM?					8	CO1	2018
	4	Explain in details the Phases of PLCM?					8	CO1	2018
2	1	Briefly explain the principles of product design process?					8	CO2	2018
	2	Explain the process of decomposition in product design					8	CO2	2018
	3	Explain steps involved in design for X?					8	CO2	2018
	4	Explain the importance of human factors in product design?					8	CO2	2018
3	1	Explain steps involved in design for X?					8	CO3	2018
	2	Explain the importance of human factors in product design?					8	CO3	2018
	3	Explain the concept of implementation of new product development ?					8	CO3	2018
	4	Explain the Concept of redesign of product?					8	CO3	2018
4	1	Explain the concept of morphological methods?					8	CO4	2018
	2	Explain the principles of relevance trees and flow diagrams?					8	CO4	2018
	3	Explain the importance of forecast technologies?					8	CO4	2018
	4	Explain the techniques of product development in business processes within organization?					8	CO4	2018
5	1	What is Virtual product development tool? Explain its components.					8	CO5	2018
	2	Explain the process of 3D CAD systems?					8	CO5	2018
	3	Explain the product configuration ?					8	CO5	2018
	4	Explain the following. 1) material master data 2) product description data					8	CO5	2018

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Blooms' Level	Identified Action Verbs for Learning	Instruction Methods for Learning	Assessment Methods to Measure Learning
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
1	**INTRODUCTION TO PLM AND PDM:**Introduction to PLM,Need for PLM,opportunities and benefits of PLM, different views of PLM, components of PLM, phases of PLM, PLM feasibility study.	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
1	PDM Strategies, strategy elements, its identification, selection and implementation. Product Data Management, implementation	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment

	of PDM systems.						
2	**PRODUCT DESIGN:** Engineering design, organization and decomposition in product design, product design process, methodical evolution in product design,	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
2	concurrent engineering, design for 'X' and design central development model. Strategies for recovery at end of life, recycling, human factors in product design. Modeling and simulation in product	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
3	**PRODUCT DEVELOPMENT:** New Product Development, Structuring new product development, building decision support system, Estimating market opportunities for new product	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
3	new product financial control, implementing new product development, market entry decision, launching and tracking new product program. Concept of redesign of product.	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
4	**TECHNOLOGY FORECASTING:** Technological change, methods of technology forecasting, relevance trees, morphological methods, flow diagram and combining forecast of technologies Integration of technological	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
4	product innovation and product development in business processes within enterprises, methods and tools in the innovation process according to the situation, methods and tools in the innovation process according to the situation.	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
5	**PRODUCT BUILDING AND STRUCTURES:** Virtual product development tools for components, machines, and manufacturing plants: 3D CAD systems, digital mock-up, model building, model analysis production (process) 16planning, and product data technology	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment
5	Product structures: Variant management, product configuration, material master data, product description data, Data models, Life cycles of individual items, status of items.	4	- L1 - L2	L2	Understand	Lecture/ Tutorial	Assignment

2. Concepts and Outcomes:

Table 2: Concept to Outcome – Example Course

Module-#	Learning or Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome **Student Should be able to ...**
A	*I*	*J*	*K*	*L*	*M*	*N*
1	-Product life-	Strategies	Product Life	field of Product Life	- Understand	Understand the

	cycle model and data management -	-	cycle model,Product Data	cycle model,the Product data management	- field of Product Life cycle model -the Product data management	field of Product Life cycle model,the Product data management
2	Decomposition of product design and model simulation	-Selection techniques for PDM -	Product design and Simulation	the process of planning and design of product model	- Understand - the process of planning and design of product model -Recycling and simulation for PDM Techniques	Understand the process of planning and design of product model,electing the techniques to recycling and simulation for PDM
3	New Product development and its structure	- Concepts of product development and structuring	Production Control techniques, new product Building	new product development through controlled techniques,structure of the new product to build	- Understand - new product development through controlled techniques -structure of the new product to build	Understand the concept of new product development through controlled techniques structure of the new product to build
4	Technological forecasting and the tools in the innovation	- Forecasting and tools for innovation	development approaches and Methods and tools of Forecasting	product development approaches and different methods and tools of Forecasting	- Understand - product development approaches and different methods and tools of Forecasting innovations	Understand techniques of product development approaches and different methods and tools of Forecasting innovations
5	-Virtual product development and Model Analysis	-Product building configuration -Analysis of model structure	Product configurations -Product Structure	product building configurations -analysis of product structure	- Understand - product building configurations -analysis of product structure	Understand the product configurations to build new product -the analysis of product structure