



**DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)**

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PERAMBALUR-621212, TAMILNADU, INDIA.
Website: www.dsengg.ac.in



P23CCT21 - PRODUCT LIFECYCLE MANAGEMENT

Syllabus:

UNIT-I HISTORY, CONCEPTS AND TERMINOLOGY OF PLM	No. of Periods: 9
Introduction to PLM, Need for PLM, opportunities of PLM, Different views of PLM - Engineering Data Management (EDM), Product Data Management (PDM), Collaborative Product Definition Management (CPDM), Collaborative Product Commerce (CPC), Product Lifecycle Management (PLM). PLM/PDM Infrastructure – Network and Communications, Data Management, Heterogeneous data sources and applications.	
UNIT-II PLM/PDM FUNCTIONS AND FEATURES	No. of Periods: 9
. User Functions – Data Vault and Document Management, Workflow and Process Management, Product Structure Management, Product Classification and Programme Management. Utility Functions – Communication and Notification, data transport, data translation, image services, system administration and application integration.	
UNIT III DETAILS OF MODULES IN APDM/PLM SOFTWARE	No. of Periods: 9
Case studies based on top few commercial PLM/PDM tools.	
UNIT-IV ROLE OF PLM IN INDUSTRIES	No. of Periods: 9
Case studies on PLM selection and implementation (like auto, aero, electronic) - other possible sectors, PLM visioning, PLM strategy, PLM feasibility study, change management for PLM, financial justification of PLM, barriers to PLM implementation, ten step approach to PLM, benefits of PLM for–business, organization, users, product or service, process performance.	
UNIT-V BASICS ON CUSTOMISATION/INTEGRATION OF PDM/PLM SOFTWARE	No. of Periods: 9
PLM Customization, use of EAI technology (Middleware), Integration with legacy data base, CAD, SLM and ERP.	

Objective:

<p>To understand history, concepts and terminology of PLM. To understand functions and features of PLM/PDM To understand different modules offered in commercial PLM/PDM tools. To demonstrate PLM/PDM approaches for industrial applications. To Use PLM/PDM with legacy data bases, CAx & ERP systems.</p>

Text Book:

<p>T1. Antti Saaksvuori and Anselmi Immonen, “Product Lifecycle Management”, Springer Publisher, 2008 (3rd Edition). T2. International Journal of Product Lifecycle Management, Inderscience Publishers. T3. Ivica Crnkovic, Ulf Asklund and Annita Persson Dahlqvist, “Implementing and Integrating Product Data Management and Software Configuration Management”, Artech House Publishers, 2003.</p>
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Reference Book:

<p>1. John Stark, “Global Product: Strategy, Product Lifecycle Management and the Billion Customer Question”, Springer Publisher, 2007. 2. John Stark, “Product Lifecycle Management: 21st Century Paradigm for Product Realisation”, Springer Publisher, 2011 (2nd Edition).</p>

UNIT-I HISTORY, CONCEPTS AND TERMINOLOGY OF PLM

2MARK

1. Define PLM and explain its importance.

Answer:

PLM (Product Lifecycle Management) is a system that manages a product from concept to disposal.

Importance:

Reduces time-to-market

Improves product quality

Enhances collaboration

Controls product data

2. Explain the need for PLM.

Answer:

Managing complex products

Handling large data

Global collaboration

Reducing design errors

Faster innovation

3. Explain opportunities of PLM.

Answer:

Cost reduction

Increased efficiency

Better decision making

Product innovation

4. Explain EDM.

Answer:

Engineering Data Management handles engineering files like CAD drawings with basic storage and retrieval.

5. Explain PDM.

Answer:

Product Data Management manages product-related data with version control, access control, and workflow.

6. Explain CPDM.

Answer:

Collaborative Product Definition Management allows teams to collaborate on product design in real-time

7. Explain CPC.

Answer:

Collaborative Product Commerce integrates suppliers and customers into product development

8. Differentiate EDM, PDM, and PLM.

Answer:

EDM → File storage

PDM → Product data control

PLM → Full lifecycle management

9. Explain PLM infrastructure.

Answer:

Includes:

Network systems

Databases

Software integration

Communication tools

10. Explain heterogeneous data in PLM.

Answer:

Different data formats from various systems (CAD, ERP) integrated into one platform.

BIG QUE:

1. Define Product Lifecycle Management (PLM) and explain its importance in modern industries.
2. Explain the need for PLM and discuss the opportunities it provides to organizations.
3. Describe the evolution of PLM from EDM → PDM → CPDM → CPC → PLM.
4. Differentiate between EDM, PDM, and PLM with suitable examples.
5. Explain the different views of PLM in detail.
6. Describe the PLM infrastructure, including network, communication, and data management.
7. Explain heterogeneous data sources and applications in PLM.
8. Discuss the key components of PLM systems.
9. Explain how PLM helps in product development lifecycle management.
10. Write short notes on:
 - EDM
 - PDM
 - CPDM
 - CPC

UNIT II PLM/PDM FUNCTIONS AND FEATURES

2 MARK

1. Explain user functions of PLM.

Answer:

- Data vault
 - Workflow management
 - Product structure
 - Classification
 - Program management
-

2. Explain data vault.

Answer:

Secure storage for product data with access control and versioning.

3. Explain workflow management.

Answer:

Controls processes like approval, review, and change management.

4. Explain product structure management.

Answer:

Manages BOM and relationships between components.

5. Explain product classification.

Answer:

Grouping products based on features or categories.

6. Explain program management.

Answer:

Planning and tracking product development projects.

7. Explain utility functions of PLM.

Answer:

- Communication
 - Data transport
 - Translation
 - Image viewing
 - Integration
-

8. Explain data translation.

Answer:

Converts data between formats (e.g., CAD formats).

9. Explain communication function.

Answer:

Provides alerts and notifications among users.

10. Explain system administration.

Answer:

Manages users, roles, permissions, and system settings.

BIG QUESTIONS

1. Explain the **user functions of PLM/PDM systems** in detail.
2. Describe **data vault and document management** in PLM systems.

3. Explain **workflow and process management** with examples.
4. Discuss **product structure management (BOM)** in PLM.
5. Explain **product classification and program management**.
6. Describe the **utility functions of PLM/PDM systems**.
7. Explain **communication and notification functions** in PLM.
8. Discuss **data transport and data translation** in PLM systems.
9. Explain **image services and system administration**.
10. Describe **application integration in PLM systems**.

UNIT III DETAILS OF MODULES IN APDM/PLM SOFTWARE

2 MARK

1. Explain PLM software modules.

Answer:

- Data management
 - Workflow
 - BOM management
 - Document control
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2. Explain data management module.

Answer:

Handles storage, retrieval, and version control of product data.

3. Explain workflow module.

Answer:

Automates processes like approval and changes.

4. Explain BOM module.

Answer:

Manages product structure and components.

5. Explain document management.

Answer:

Controls documents like drawings and reports.

6. Explain case study of PLM implementation.

Answer:

Example: Automotive company using PLM to reduce design time and improve collaboration.

7. Compare PLM tools.

Answer:

Different tools vary in features, scalability, and integration.

8. Advantages of PLM software.

Answer:

- Better collaboration
 - Faster design
 - Reduced errors
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9. Challenges in PLM tools.

Answer:

- Cost
 - Training
 - Integration issues
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10. Role of PLM tools.

Answer:

Helps manage product lifecycle efficiently.

BIG QUESTIONS

1. Explain the major modules of PLM/PDM software.
2. Describe the data management module in PLM systems.
3. Explain the workflow management module with examples.
4. Discuss the product structure (BOM) management module.
5. Explain the document management module in PLM software.
6. Compare different commercial PLM tools based on features.
7. Explain a case study of PLM implementation in any industry.
8. Discuss the advantages of PLM software modules.
9. Explain the challenges faced in PLM implementation.
10. Describe the role of PLM software in product lifecycle management.

UNIT IV ROLE OF PLM IN INDUSTRIES

2 MARK

1. Explain role of PLM in industries.

Answer:

PLM improves product design, reduces cost, and enhances collaboration.

2. Explain PLM in automobile industry.

Answer:

Used for design, testing, and manufacturing integration.

3. Explain PLM in aerospace.

Answer:

Handles complex product data and safety requirements.

4. Explain PLM strategy.

Answer:

Plan for implementing PLM effectively.

5. Explain PLM vision.

Answer:

Long-term goals of PLM adoption.

6. Explain feasibility study.

Answer:

Analyzes cost, benefits, and risks.

7. Explain change management.

Answer:

Managing employee adaptation to PLM.

8. Explain financial justification.

Answer:

Evaluating ROI and cost benefits.

9. Explain barriers to PLM.

Answer:

- Cost
 - Resistance
 - Complexity
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10. Explain benefits of PLM.

Answer:

- Better quality
- Faster production
- Improved coordination

BIG QUESTIONS

1. Explain the role of PLM in various industries with examples.
2. Discuss the implementation of PLM in the automobile industry.
3. Explain the role of PLM in aerospace and electronics industries.
4. Describe the PLM vision and PLM strategy.
5. Explain the PLM feasibility study process.
6. Discuss change management in PLM implementation.
7. Explain the financial justification of PLM with ROI.
8. Describe the barriers to PLM implementation.
9. Explain the ten-step approach to PLM implementation.
10. Discuss the benefits of PLM for:

- Business
- Organization
- Users
- Product
- Process

UNIT V BASICS ON CUSTOMISATION/INTEGRATION OF PDM/PLM SOFTWARE

2 MARK

1. Explain PLM customization.

Answer:

Modifying PLM software based on company needs.

2. Explain integration in PLM.

Answer:

Connecting PLM with other systems like CAD and ERP.

3. Explain EAI.

Answer:

Enterprise Application Integration connects different software using middleware.

4. Explain middleware.

Answer:

Software that connects multiple applications.

5. Explain integration with CAD.

Answer:

Allows design data sharing with PLM.

6. Explain integration with ERP.

Answer:

Connects business processes with product data.

7. Explain integration with legacy systems.

Answer:

Brings old data into new PLM system.

8. Explain SLM integration.

Answer:

Manages service lifecycle data.

9. Benefits of integration.

Answer:

- Better data flow
 - Reduced duplication
 - Improved efficiency
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10. Challenges of integration.

Answer:

- Compatibility issues
- Cost
- Data migration problems

BIG QUESTION

1. Explain **PLM customization** and its importance.
2. Describe **integration in PLM systems** with examples.
3. Explain **Enterprise Application Integration (EAI)** and its role in PLM.
4. Discuss the **role of middleware in PLM integration**.
5. Explain **integration of PLM with CAD systems**.
6. Describe **integration of PLM with ERP systems**.
7. Explain **integration with legacy databases**.
8. Discuss **integration with Service Lifecycle Management (SLM)**.
9. Explain the **benefits of PLM integration**.
10. Describe the **challenges in PLM customization and integration**.