Course Structure & Syllabus
GTM – Domain

Code	Subject	Course Type	Credit
CUGM2140	DESIGN THINKING & MANAGING INNOVATION THROUGH GATE PROCESS	T + P + PJ (1+2+0)	3
CUGM2141	PLM TOOLS ON DASSAULT PLATFORM (DESIGN AND VALIDATION USING DYMOLA, CATIA, SIMULIA)	T + P + PJ (2+6+0)	8
CUGM2142	PROCESS MANAGEMENT USING ENOVIA	T + P + PJ (1+2+0)	3
CUGM 2143	PRODUCT Development	T-P-Pj(0-0-8)	8
	TOTAL CREDITS	*T-P-Pj(4-10-8)*	*22*

Domain Track Title :Go To Market-Product Development

Track Total Credits (4-10-8)

Courses Division(list all divisions):

- Design Thinking and Managing Innovation Through GATE Process (1-2-0)
- PLM Tools on Dassault Platform (Design and Validation using Dymola, Catia, Simulia) (2-6-0)
- Process management (Using Enovia) (1-2-0))
- Product Development (0-0-8)

Domain Track Objectives:

- To familiarise the student with Industrial Product Life Cycle Management Processes
- Teach Dassault tools for PLM
- Develop digital prototypes of the products and validate them and innovate for design efficiency

Domain Track Course outcomes:

- A Digitally Validated Innovatively and efficiently designed product
- Experience with 3 D experience platform Catia- Simulia- Dymola and Enovia tools
- PLM cycle management
- Process Quality monitoring through GATE process

Domain Syllabus:

1.Design Thinking and Managing Innovation Through GATE Process (1-2-0)

1.1 Customer or User Requirement for Specification(Gate 0)

1.2Requirement gathering and feasibility study of the project

1.3understanding users' motivations and to gather deep insights about a product

1.4challenges and benefits of the products

1.5Understanding the product through literature survey and available resources

1.6Market analysis of existing products

1.7Finalizing the product specification

1.8Preparing a project plan

2.1Design Parameter Optimization in Dymola (Gate 1)

Designing and simulating system and subsystem of the product using system Engineering Dymola

2.2Final functional and logical design of integrated product in system engineering with simulation.

2.2Customizing the product properties with required inputs and analyzing the outputs.

3.1CATIA Drawing with Styling(Full product drawing) (Gate 2)

3.2CATIA part design with assembly design of the product.

3.3Behaviour experience of the product

4.1Digital Testing and Validation of the Product Using Simulia (Gate 3)

4.2Complete structural, thermal, mechanical simulations with other required simulation is done   for the product**.**

5.1Regulatory Certification (Gate 4)

5.2Once the regulatory certification for a particular product is over through certain testing and validation, the product is all set for the next stage**.**

6.1BOM and Production planning and Vendors development (ENTRY)

6.2 Launching of Product.

2.PLM Tools on Dassault Platform (Design and Validation using Dymola, Catia, Simulia) (2-6-0)

2.1 System Engineering Dymola

2.2Finding energetic dimension of the desired product

2.3Designing system and subsystem using behaviour modelling work bench

2.4Getting familiar with Dymola- modellica library.

2.6Understanding the behaviour of the model through input n output data

2.7Customizing the product properties

2.8System Integration with product dimension.

2.10Functional and logical design of integrated product in system engineering.

2.11D Model using CATIA

2.12ATIA part design of different components

2.13Surface designing for creating high end complex design

2.14Assembly Designing of the complete product

2.15Wire routing and entire harnessing of the design.

2.16Mechanical system Designing of the product

2.17CATIA live rendering

2.18Behaviour experience of the complete product.

2.19Design validation/Simulation using Simulia

2.20Simulation using Simulia

2.21Classification of simulation

2.22Structural simulation, Thermal simulation and both

2.23Linear and non linear analysis

2.24CFD Analysis, Fatigue, Durability

2.25Explicit Analysis, Crash Analysis(Abaqus)

3.Process management (Using Enovia) (1-2-0)

3.1Introduction to project management, Project Definition, Project Initiation

3.2Need for Project Management

3.3Provide vision and direction, increase efficiency, Control.

3.4Project scope, manage costs, manage time, Schedule the work

3.5Deal with potential risks

3.6Project Management Principles, Project structure, Clear goals

3.7 Transparency about project status, Risk recognition,

3.8The Project Life Cycle: The project initiation stage, The project planning stage, The project execution stage, The project closure stage.

3.9Project Identification and Selection: Introduction, Project Identification Process

3.10 Project Initiation, Pre-Feasibility Study, Feasibility Studies, Project Break-even point

3.11 Core functionality integration with different engineering IT tools, specifically

with **Catia,Delmia, Dymola, Simulia** etc.

3.12 PDM (product data management) systems and their implementations in product lifecycle

(Enovia)

3.13 Exemplification on how PLM functionality can be used to facilitate increased information

management efficiency and exchange (Enovia)

3.14 Resources Considerations in Projects: Resource Allocation, Scheduling, Project Cost

Estimate and Budgets, Cost Forecasts (Enovia)

4. Product Development (0-0-8)

4.1 The Domain will be delivered through case studies, assignments and product

development.

4.2 The outcome will be an end to end digital prototype of a product, which may be

patentized.

4.3 Product Development Stack :
1. E- Cart (Full product)
2. E- SCV (Modular Platform design and electric power train design , BIW)
3. Insulin Pump (Design of different components like control unit, PCB, micro dc motor)
4. 500 kg Payload Drone (Design of Mechanical system)

Session Plan for the Entire Domain:

		Design Thinking and Managing Innovation Through GATE Process (1-2-0)
Session	1	1.1 Customer or User Requirement for Specification(Gate 0)
Session	2	1.2Requirement gathering and feasibility study of the project
Session	3	1.3Market analysis of existing products
Session	4	1.4Finalizing the product specification and preparing a project plan
Session	5	1.5 Design Parameter Optimization in Dymola (Gate 1)
Session	6	1.6Designing and simulating system and subsystem of the product using system Engineering Dymola
Session	7	1.7Final functional and logical design of integrated product in system engineering with simulation.
Session	8	1.8CATIA Drawing with Styling(Full product drawing) (Gate 2)
Session	9	1.9Digital Testing and Validation of the Product Using Simulia (Gate 3)
Session	10	1.10.Regulatory Certification (Gate 4) BOM and Production planning and Vendors development (ENTRY)
Practice(2h)	1	1.1 Customer or User Requirement for Specification and Requirement gathering and feasibility study of the project
Practice(2h)	2	1.3Market analysis of existing products and Finalizing the product specification and preparing a project plan
Practice(2h)	3	Review(Gate 0)

Practice(2h)	4	1.5Design Parameter Optimization in Dymola	
Practice(2h)	5	1.6Designing and simulating system and subsystem of the product using system Engineering Dymola	
Practice(2h)	6	Review(Gate 1)	
Practice(2h)	7	1.7Final functional and logical design of integrated product in system engineering with simulation.	
Practice(2h)	8	1.8CATIA Drawing with Styling(Full product drawing) (Gate 2)	
Practice(2h)	9	Review	
Practice(2h)	10	1.9Digital Testing and Validation of the Product Using Simulia (Gate 3)	
Practice(2h)	11	1.10.Regulatory Certification (Gate 4) BOM and Production planning and Vendors development (ENTRY)	
Practice(2h)	12	Review	
		2.PLM Tools on Dassault Platform (Design and Validation using Dymola, Catia, Simulia) (2-6-0)	
Session	1	2.1 System Engineering Dymola	
Session	2	2.2 Finding energetic dimension of the desired product	
Session	3	2.3 Designing system and subsystem using behaviour modelling work bench	
Session	4	2.4 Getting familiar with Dymola- modellica library.	
Session	5	2.5 Understanding the behaviour of the model through input n output data	
Session	6	2.6 Customizing the product properties	
Session	7	2.7 System Integration with product dimension.	
Session	8	2.8 Functional and logical design of integrated product in system engineering.	
Session	9	2.9 3D Model using CATIA	
Session	10	2.10 CATIA part design of different components	
Session	11	2.11 Surface designing for creating high end complex design	
Session	12	2.12 Assembly Designing of the complete product	
Session	13	2.13 Wire routing and entire harnessing of the design.	
Session	14	2.14 Mechanical system Designing of the product	
Session	15	2.15 CATIA live rendering	
Session	16	2.16 Behaviour experience of the complete product.	
Session	17	2.17 Design validation/Simulation using Simulia	
Session	18	2.18 Simulation using Simulia,Classification of simulation,Structural simulation, Thermal simulation and both	
Session	19	2.19 Linear and non linear analysis	
Session	20	2.20 CFD Analysis, Fatigue, Durability,Explicit Analysis, Crash Analysis(Abaqus)	
Practice(3 h)	1	P2.1 System Engineering Dymola	
Practice(3 h)	2	P2.2 Finding energetic dimension of the desired product	
Practice(3 h)	3	P2.3 Designing system and subsystem using behaviour modelling work bench	
Practice(3 h)	4	P2.4 Getting familiar with Dymola- modellica library.	
Practice(3 h)	5	P2.5 Understanding the behaviour of the model through input n output data	
Practice(3 h)	6	P2.6 Customizing the product properties	

Practice(3 h)	7	P2.7 System Integration with product dimension.
Practice(3 h)	8	P2.8 Functional and logical design of integrated product in system engineering.
Practice(3 h)	9	P2.9 3D Model using CATIA https://www.youtube.com/watch?v=lSdup32L6Mw
Practice(3 h)	10	P2.10 CATIA part design of different components https://www.youtube.com/watch?v=CQWjb91_vKg
Practice(3 h)	11	P2.11 Surface designing for creating high end complex design https://www.youtube.com/watch?v=RT24Yj5thd8
Practice(3 h)	12	P2.12 Assembly Designing of the complete product https://www.youtube.com/watch?v=B7_irVMmOzw
Practice(3 h)	13	P2.13 Wire routing and entire harnessing of the design.
Practice(3 h)	14	P2.14 Mechanical system Designing of the product https://www.youtube.com/watch?v=B-XoaRfeD9w
Practice(3 h)	15	P2.15 CATIA live rendering https://www.youtube.com/watch?v=HsK3RVTOX1Q
Practice(3 h)	16	P2.16 Behaviour experience of the complete product https://www.youtube.com/watch?v=9RgdZUvEjPw
Practice(3 h)	17	P2.17 Design validation/Simulation using Simulia https://www.youtube.com/watch?v=cDDeWRB7PCs
Practice(3 h)	18	P2.18 Simulation using Simulia https://www.youtube.com/watch?v=cDDeWRB7PCs
Practice(3 h)	19	P2.19 Classification of simulation https://www.youtube.com/watch?v=gVlvp1RDi2s
Practice(3 h)	20	P2.20 Structural simulation, Thermal simulation and both
Practice(3 h)	21	P2.21 Linear and non linear analysis
Practice(3 h)	22	P2.22 CFD Analysis, Fatigue, Durability
Practice(3 h)	23	P2.23 Explicit Analysis, Crash Analysis(Abaqus)
Practice(3 h)	24	P2.24 Explicit Analysis, Crash Analysis(Abaqus)
Practice(3 h)	25	P2.25 CFD Analysis, Fatigue, Durability
		3.Process management (Using Enovia) (1-2-0)
Session	1	3.1 Introduction to project management, Project Definition, Project Initiation
Session	2	3.2 Need for Project Management
Session	3	3.3 Provide vision and direction, increase efficiency, Control.
Session	4	3.4 Project scope, manage costs, manage time, Schedule the work
Session	5	3.5 Project Management Principles, Project structure, Clear goals
Session	6	3.6 Transparency about project status, Risk recognition, Deal with potential risks
Session	7	3.7 The Project Life Cycle: The project initiation stage, The project planning stage, The project execution stage, The project closure stage.
Session	8	3.8 Project Identification and Selection: Introduction, Project Identification Process
Session	9	3.9 Project Initiation, Pre-Feasibility Study, Feasibility Studies, Project Break-even point
Session	10	3.10 Core functionality integration with different engineering IT tools, specifically with Catia,Delmia, Dymola, Simulia etc.
Practice(2 h)	1	P3.1 Getting started with Enovia with known use case.

Practice(2 h)	2	P3.2 Practicing for the given project
Practice(2 h)	3	P3.3 Define an existing project using Enovia
Practice(2 h)	4	P3.4 Practicing for the given project
Practice(2 h)	5	P3.5 Learning Task allocation for an existing project using Enovia
Practice(2 h)	6	P3.6 Practicing for the given project
Practice(2 h)	7	P3.7 Resource allocation for different tasks in an existing project using Enovia
Practice(2 h)	8	P3.8 Practicing for the given project
Practice(2 h)	9	P3.9 Review and monitoring of an existing project through Enovia
Practice(2 h)	10	P3.10 Practicing for the given project
Practice(2 h)	11	P3.11 Uploading deliverables of the project through Enovia
Practice(2 h)	12	P3.12 Practicing for the given project

List of Projects/ papers/jobs/products to be done in domain: