

BMEE307L	Product Design and Development	L	T	P	C
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Pre-requisite	Nil	Syllabus version			
		1.0			
Course Objectives					
<ol style="list-style-type: none"> 1. To discuss about Product requirement analysis, concept generation, detailed design verification by quick design techniques. 2. To provide students with technical and practical knowledge and skills required to engage in Product development projects and intellectual property rights. 					
Course Outcome					
At the end of the course, the student will be able to					
<ol style="list-style-type: none"> 1. Illustrate the basics of product design and development processes and organisation policies. 2. Infer the workplace management, health and safety management. 3. Apply the methods of generating, evaluating and testing to select the best product concept. 4. Demonstrate the methods of design problem solving and concept generation to testing. 5. Practice the industrial design and Design for X. 6. Infer the process of intellectual property rights. 					
Module:1	Introduction	7 hours			
The design process –product life cycle –product development process – Collaborative product development – concurrent engineering - Strategic Planning and Opportunity Identification for new products – Identifying Market Opportunities – Communication with Stake holders in line with organizational policy and requirements					
Module:2	Organizational Competency Management	6 hours			
Organization’s policies and procedures for working with colleagues, Competency, skills and knowledge requirements for working effectively; health and safety management – OSHA; Competency development, Training need analysis; skills need analysis					
Module:3	Product Specifications	5 hours			
Voice of Customer – customer survey – need gathering methods – Explore systematically - Establishing product specification -competitive benchmarking; House of Quality, Lean Thinking					
Module:4	Problem Solving	5 hours			
Need for design creativity - Creative thinking – creativity and problem solving – TRIZ-Morphological approach					
Module:5	Concept Generation	5 hours			
Concept Generation - Concept Screening- Concept Scoring – Concept Testing methods - Case Studies					
Module:6	Embodiment Design and Industrial design	6 hours			
Introduction to embodiment design – product architecture – Configuration Design – Parametric Design - Test and Validation – Detail design - Industrial design – human factors design					
Module:7	Design for X, Prototype and IP	9 hours			
Design for Manufacture - Design for Assembly - Design for serviceability – design for environment -- Design for Quality - Reliability – Sustainability. Failure Mode and Effect Analysis - Test and Inspection –Warranty; Cost evaluation –categories of cost – overhead costs – activity based costing Prototyping and Testing; Product Testing- Standards, Certification and Documentation. – Intellectual Property Rights - Patents, Design Patents, Trade Marks, Trade Secrets and copyrights					
Module:8	Contemporary issues	2 hours			

	Total Lecture hours:		45 hours
Text Book			
1.	Karl T. Ulrich, Steven D. Eppinger, Product Design and Development, 2015, 6 th Edition, McGraw-Hill.		
Reference Books			
1.	George E. Dieter, Linda C. Schmidt, Engineering design, 2017, 4 th Edition, McGraw-Hill.		
2.	Kevin Otto, Kristin Wood, Product Design, 2004, Pearson Education.		
3.	Armstrong S, Engineering and Product Development Management: The Holistic Approach, 2001, Cambridge University Press.		
Mode of Evaluation: CAT, written assignment, Quiz, FAT.			
Recommended by Board of Studies		09-03-2022	
Approved by Academic Council	No. 65	Date	17-03-2022