

FR. Conceicao Rodrigues College Of Engineering
Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50
Department of Production Engineering

B.E. (Production) (semester VII) (2020-2021)

Lecture Plan

Subject: Product Design and Industrial Marketing (PEDLO8011)

Credits-04

1. Syllabus.

Module	Contents	Hrs.
01	<p>1.1. Introduction: Definition of product design, Classification of products, Design by evolution, Design by innovation, Product Mix, Various phases in product development and Design, Morphology of Design, Considerations in product design, Product specifications.</p> <p>1.2. Conceptual Design: Market research, Generation , Selection and Embodiment of concept, Product Architecture, Customer centric product designing</p> <p>1.3. Creativity: Role of creativity in problem solving, Vertical and lateral thinking, Brain storming, Synectics, Group working dynamics, Adaptation to changing scenarios in economics, social, cultural and technological fronts, Anticipation of new needs and aspirations.</p> <p>1.4. Materials: Overview of materials including new generation materials, Tailor made material concepts, Material selection process.</p>	06
02	<p>2.1. Design for manufacturing (DFM): Guidelines and Methodology, Producibility requirements, Accuracy and Precision requirements, Strength considerations in Design: Criteria and objectives, Designing for uniform strength, Designing for stiffness and rigidity, Practical ideas for material saving in design - ribs, corrugations, rim shapes, bosses, laminates, etc.</p> <p>2.2. Design for forged and Cast components, Design for Sheet Metal processed components, powder metallurgical components, Expanded metals and wire forms</p>	12

	<p>2.3. Designing with plastics: Mechanical behavior, special characteristics and considerations, Design concepts for product features to be manufactured by various production process technologies, Special considerations for designing of components for load bearing applications,</p> <p>2.4. Other DFX Principles : Designs for Maintainability, Safety, Reliability, Sustainable Design</p> <p>2.5. Design for Assembly (DFA): DFA Index, Analysis of assembly requirements, Standardization, Ease of Assembly and disassembly, Design for bolted, welded and riveted components, Design for hinge and snap fit assemblies, maintenance, consideration of handling and safety, Modular concepts.</p>	
03	<p>3.1. Product Ergonomics: Anthropometry, Environmental conditions, thermal, noise, vibration, displays, illusions, Psycho and psychological aspects in design, Man-machine information exchange.</p> <p>3.2. Product Aesthetics: Visual awareness, Form elements in context of product design, Concepts of size, shape and texture, Introduction to colour and colour as an element in design, Colour classifications and dimensions of colour, Colour combinations and colour dynamics, Interaction / communication of colours, Psychological aspects of colours, generation of products forms with analogies from nature.</p> <p>3.3. Product Graphics: Graphics composition and layout, Use of grids in graphics composition, Study of product graphics and textures.</p>	06
04	<p>4.1. Value Engineering: Product value and its importance, Value analysis job plan, Steps to problem solving and value analysis, Value analysis tests, Value Engineering idea generation check list, Material and process selection in value engineering, Cost reduction, case studies and exercises.</p> <p>4.2. Software solutions: Software for drafting, modeling, assembly, detailing, CAM interfacing, Rapid tooling/rapid prototyping, etc.</p> <p>4.3. Modern Applications: Concurrent Engineering, Robust Design, Additive Manufacturing/Rapid Prototyping, Product Life Cycle Management techniques and application areas.</p>	08
05	<p>Introduction to Industrial Marketing, Understanding Industrial Markets, Nature of Industrial Buying, Industrial Market Segmentation, New Products and Established product strategies, Resource based and Value based strategy, Industrial Pricing: Price Determinants, Pricing Policies, Pricing Decisions, Pricing - Value based and Competition based.</p>	08
06	<p>6.1. Industrial Marketing Channels: Channel participants, Channel effectiveness, Marketing logistics, Physical Distribution and Marketing Strategy, Value added market channels</p> <p>6.2. Industrial Marketing Communication, Advertising, Sales promotion, Publicity Media Plan, Integrated Promotion Plan, Industrial Sales force Management, Technical Support for Marketing – customer technical services and feedback.</p>	08

2. CO Statements.

Learner will be able to

PEDLO8011.1. Design and develop products right from the conceptual level.

PEDLO8011.2. Demonstrate concept of computer aided product design approach.

PEDLO8011.3. Illustrate various modern approaches like concurrent engineering, product life cycle management, robust design, rapid prototyping / rapid tooling.

PEDLO8011.4. Analyze products based on ergonomics and aesthetic aspects.

PEDLO8011.5. Apply appropriate strategies in industrial marketing.

PEDLO8011.6. Demonstrate various aspects related to Industrial Marketing Communication, Advertising, Sales promotion, Publicity Media Plan.

3. CO-PO-PSO Mapping.

CO# / PO#	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
PEDLO8011.1	3	3	3	-	-	-	-	-	-	-	-	-
PEDLO8011.2	3	3	3	-	-	-	-	-	-	-	-	-
PEDLO8011.3	3	3	3	-	2	-	-	-	-	-	-	-
PEDLO8011.4	3	3	3	-	-	-	-	-	-	-	-	-
PEDLO8011.5	3	3	3	-	-	-	-	-	-	-	-	-
PEDLO8011.6	3	3	3	-	-	-	-	-	-	-	-	-

CO# / PSO#	PSO1	PSO2
PEDLO8011.1	3	-
PEDLO8011.2	3	-
PEDLO8011.3	3	2
PEDLO8011.4	3	-
PEDLO8011.5	3	-
PEDLO8011.6	3	-

4. CO Assessment tools with target.

	Target for Assessment Tools		
	Unit Test	End Semester Exam	Course Exit Survey

PEDLO8011.1	60%	60%	70%
PEDLO8011.2	-	60%	70%
PEDLO8011.3	60%	60%	70%
PEDLO8011.4	-	60%	70%
PEDLO8011.5	60%	60%	70%
PEDLO8011.6	60%	60%	70%

5. Curriculum Gap/Content beyond syllabus (if any).

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6. Lecture/Lab/Mini Project/Assignment Plan.

Week	Duration (Hrs.)	Topic	Module
Week 1 (13/07/20 – 17/07/20)	4	Introduction: Definition of product design, Classification of products, Design by evolution, Design by innovation, Product Mix, Various phases in product development and Design,	1
Week 2 (20/07/20 – 24/07/20)	4	Morphology of Design, Considerations in product design, Product specifications. 1.2. Conceptual Design: Market research, Generation , Selection and Embodiment of concept,	1
Week 3 (27/07/20 – 31/07/20)	4	Product Architecture, Customer centric product designing Materials: Overview of materials including new generation materials, Tailor made material concepts, Material selection process	1
Week 4 (03/08/20 – 07/08/20)	4	Design for manufacturing (DFM): Guidelines and Methodology, Producibility requirements, Accuracy and Precision requirements, Strength considerations in Design: Criteria and objectives, Designing for uniform strength, Designing for stiffness and rigidity, Practical ideas for material saving in design - ribs, corrugations, rim shapes, bosses, laminates, etc. 2.2. Design for forged and Cast components, Design for Sheet Metal processed components, powder metallurgical components, Expanded metals and wire forms	2

<p>Week 5 (10/08/20 – 14/08/20)</p>	<p>4</p>	<p>Other DFX Principles : Designs for Maintainability, Safety, Reliability, Sustainable Design 2.5. Design for Assembly (DFA): DFA Index, Analysis of assembly requirements, Standardization, Ease of Assembly and disassembly, Design for bolted, welded and riveted components, Design for hinge and snap fit assemblies, maintenance, consideration of handling and safety, Modular concepts.</p>	<p>2</p>
<p>Week 6 (17/08/20 – 21/08/20)</p>	<p>4</p>	<p>Designing with plastics: Mechanical behavior, special characteristics and considerations, Design concepts for product features to be manufactured by various production process technologies, Special considerations for designing of components for load bearing applications,</p>	<p>2</p>
<p>Mid Term Break</p>			
<p>Week 7 (31/08/20 – 09/09/20)</p>	<p>4</p>	<p>Product Ergonomics: Anthropometry, Environmental conditions, thermal, noise, vibration, displays, illusions, Psycho and psychological aspects in design, Man-machine information exchange. 3.2. Product Aesthetics: Visual awareness, Form elements in context of product design, Concepts of size, shape and texture, Introduction to colour and colour as an element in design, Colour classifications and dimensions of colour, Colour combinations and colour dynamics, Interaction / communication of colours, Psychological aspects of colours, generation of products forms with analogies from nature.</p>	<p>3</p>
<p>Week 8 (07/09/20 – 11/09/20)</p>	<p>4</p>	<p>Product Graphics: Graphics composition and layout, Use of grids in graphics composition, Study of product graphics and textures. Software solutions: Software for drafting, modeling, assembly, detailing, CAM interfacing, Rapid tooling/rapid prototyping, etc.</p>	<p>3 and 4</p>
<p>Week 9 (14/09/20 – 18/09/20)</p>	<p>4</p>	<p>Value Engineering: Product value and its importance, Value analysis job plan, Steps to problem solving and value analysis, Value analysis tests, Value Engineering idea generation check list, Material and process selection in value engineering, Cost reduction, case studies and exercises.</p>	<p>4</p>

		Revision for UT1	
	UT1		
Week 11 (28/09/20 – 02/10/20)	4	Modern Applications: Concurrent Engineering, Robust Design, Additive Manufacturing/Rapid Prototyping, Product Life Cycle Management techniques and application areas.	4
Week 12 (05/10/20 – 09/10/20)	4	Introduction to Industrial Marketing, Understanding Industrial Markets, Nature of Industrial Buying, Industrial Market Segmentation, New Products and Established product strategies, Resource based and Value based strategy, Industrial Pricing: Price Determinants, Pricing Policies, Pricing Decisions, Pricing - Value based and Competition based.	4
Week 13 (12/10/20 – 16/10/20)	4	6.1. Industrial Marketing Channels: Channel participants, Channel effectiveness, Marketing logistics, Physical Distribution and Marketing Strategy, Value added market channels	5
Week 14 (19/10/20 – 23/10/20)	4	6.2. Industrial Marketing Communication, Advertising, Sales promotion, Publicity Media Plan, Integrated Promotion Plan, Industrial Sales force Management, Technical Support for Marketing – customer technical services and feedback. Revision for UT2	6
Week 16	Unit Test – II		