

1.	Title of the course	Product Design and Development
2.	Course number	ME512L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To ME5202/6
6.	To be offered by	Department of Mechanical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	<p><b>Course Objective(s):</b> This course is intended to introduce overall awareness of the product design process. It introduces the methods, tools and principles applied in industries for the design and development of the product. This course emphasises on methodologies for various steps of product design such as user study, need/problem identification, competitive benchmarking, aspects of human factors in product design, creative concept generation, prototyping/model making and evaluation techniques</p>	
10.	<p><b>Course Content:</b> Design methodology and philosophy- types of designs, design models, concurrent engineering, product life cycle. Design Teams – Organizations &amp; product Planning. Need Analysis &amp; Scope- mission statement, customer study, Kano diagram-Establishing Product Function- functional decomposition, FAST and SOP, function structure. Product Tear down- reverse engineering. Product Specifications product design tools, QFD, Computer Aided Design, Robust design, DFX, DFM, DFA, DFMA, DFSS. Design guidelines for metallic and non-metallic products to be manufactured by various processes. Generation and evaluation of concepts – TRIZ, Decision matrix etc. Industrial Design – aesthetics and ergonomic aspects of product design. Value Engineering. Failure mode and effects analysis</p>	
11.	<p><b>Textbook(s):</b></p> <ol style="list-style-type: none"> <li>1. Eppinger S, Ulrich K, Product design and development, McGraw-Hill, (2000).</li> <li>2. Kevin Otto , Kristin Wood, Product design, Pearson, (2004).</li> </ol>	
12.	<p><b>Reference(s):</b></p> <ol style="list-style-type: none"> <li>1. George E. Dieter, Engineering Design, McGraw Hill (2000).</li> <li>2. David G Ullman, <i>The Mechanical Design Process</i>, McGraw Hill (2003).</li> </ol>	