PROF. ASOKAN T
Department of Design Engineering
IIT Madras

INTENDED AUDIENCE : Undergraduate/graduate students interested in new product development

COURSE OUTLINE :
Introduce Engineering Design as a structured process, different from the Conventional Design Engineering. Learn the importance of Systematic Design Process in Product Design Identify various steps involved in the design process. Learn the importance of function and form in the design process Apply the systematic design process for product development.

ABOUT INSTRUCTOR :
Prof. T Asokan is a Professor in the Department of Engineering Design, and currently the Head of the Department, at IIT Madras. He completed his B.Tech. and M.Tech. in mechanical engineering and received his Ph.D in Mechanical Engineering from the Indian Institute of Technology Madras. Prior to joining IIT Madras, he was with the Robotics Research Center, Nanyang Technological University, Singapore working in the area of robotic system development. He was awarded the Stanford-India biodesign fellowship by the Stanford University, USA in 2009 and has completed a post doctoral fellowship in medical device development at the Stanford University. He is currently the national secretary of The Robotics Society. He has more than 25 years of professional experience in research and teaching in the broad areas of Robotics, Product design, and Engineering System design. Prof. Asokan has published more than 100 papers in International Journals and conferences and has filed 18 patents in India, USA, and Singapore. More details can be found at https://ed.iitm.ac.in/~asokan/

COURSE PLAN :

Week 1 : Introduction, Birth and Growth of a Product

Week 2 : Types of Design, Stage-Gate and Spiral Design, Stages in New Product Development, Laboratory Exercise - 1

Week 3 : Reverse Engg. and Redesign, Technical Questioning and Mission Statement, Mission Statement-Examples, Laboratory Exercise – 2

Week 4 : Identifying Customer Needs, Customer Need Analysis, Product Specifications, Laboratory Exercise - 3

Week 5 : Need - Metric Matrix, Establishing Target Specifications, HoQ, Laboratory Exercise 4

Week 6 : Functional Decomposition, FAST Method, Laboratory Exercise - 5

Week 7 : Function Structure (Flow Method), Flow Method Examples, Laboratory Exercise - 6

Week 8 : Product and Portfolio Architecture, Portfolio Architecture Selection Laboratory Exercise - 7

Week 9 : Product Architecture, Identification of Modules, Laboratory Exercise - 8

Week 10: Concept Development, Intuitive Methods, Laboratory Exercise - 9

Week 11: Logical Method- TRIZ, Concept Selection, Laboratory Exercise 10

Week 12: Concept Scoring, Laboratory exercise 11