Design For Manufacturing - Web course

COURSE OUTLINE

Concepts of Design for Manufacturing (DFM); Role of DFM in product specification and standardization, Methods of material, shape and process selections, Design rules for manufacturing and assembly processes, Design for quality and reliability, Approach towards robust design, Design for optimization, Case studies on design for manufacturing and assembly.

COURSE DETAIL

Module	Lecture	No.of Hours
Introduction	Need Identification and Problem Definition	01
	Concept Generation and Evaluation	01
	Embodiment Design	01
Selection of Materials and Shapes	Properties of Engineering Materials	02
	Selection of Materials – I	02
	Selection of Materials - II	01
	Case Studies - I	01
	Selection of Shapes	01
	Co-selection of Materials and Shapes	01
	Case Studies - II	01
Selection of Manufacturing Processes	Review of Manufacturing Processes	02
	Design for Casting	02

NPTEL

http://nptel.iitm.ac.in

Mechanical Engineering

Pre-requisites:

Introduction to Engineering Materials, Manufacturing Processes

Coordinators:

Prof. A. De
Department of Mechanical EngineeringIIT Bombay

	Design for Bulk Deformation Processes	01
	Design for Sheet Metal Forming Processes	01
	Design for Machining	02
	Design for Powder Metallurgy	01
	Design for Polymer Processing	01
	Co-selection of Materials and Processes	02
	Case-Studies - Ill	01
Design for Assembly	Review of Assembly Processes	02
	Design for Welding – I	02
	Design for Welding - Il	01
	Design for Brazing and Soldering	01
	Design for Adhesive Bonding	01
	Design for Joining of Polymers	01
	Design for Heat Treatment	01
	Case-Studies - IV	01
Design for Reliability and Quality	Failure Mode and Effect Analysis	01
	Design for Quality	01
	Design for Reliability	01
	Approach to Robust Design	02
	Design for Optimization	02

Total = 04	**Total** = 32	**Total** = 42

References:

1. M F Ashby and K Johnson, Materials and Design - the art and science of material selection in product design, Butterworth-Heinemann, 2003.
2. G Dieter, Engineering Design - a materials and processing approach, McGraw Hill, NY, 2000.
3. M F Ashby, Material Selection in Mechanical Design, Butterworth-Heinemann, 1999.
4. T H Courtney, Mechanical Behavior of Materials, McGraw Hill, NY, 2000.
5. K G Swift and J D Booker, Process selection: from design to manufacture, London: Arnold, 1997.
6. S S Rao, Engineering Optimization: theory and practice, John Wiley, NY, 1996.
7. G Boothroyd, P Dewhurst and W Knight, Product design for manufacture and assembly, John Wiley, NY: Marcel Dekkar, 1994.
8. J G Bralla, Handbook for Product Design for Manufacture, McGraw Hill, NY, 1998.
9. Houldcroft, Which Process – an introduction to welding and related processes and guide to their selection, Cambridge, Abington Pub., 1990.
10. ASTM Design handbook.