

TEXT BOOKS:

1. **Design and Analysis of Experiments**, Douglas C. Montgomery, 5th Edition Wiley India Pvt. Ltd. 2007
2. **Quality Engineering using Robust Design**, Madhav S. Phadke, Prentice Hall PTR, Englewood Cliffs, New Jersey 07632, 1989.

REFERENCE BOOK:

1. **Quality by Experimental Design**, Thomas B. Barker, Marcel Dekker, Inc ASQC Quality Press.1985.
2. **Experiments Planning, analysis, and parameter Design optimization**, C.F. Jeff Wu Michael Hamada, John Wiley Editions. 2002.
3. **Reliability Improvement by Experiments**, W.L. Condra, Marcel Dekker, Inc ASQC Quality Press.1985.
4. **Taguchi Techniques for Quality Engineering**, Phillip J. Ross, 2nd Edn. McGraw Hill International Editions, 1996.

DESIGN FOR MANUFACTURING AND ASSEMBLY

Subject Code	: 10ME848	IA Marks	: 25
Hours/Week	: 04	Exam Hours	: 03
Total Hours	: 52	Exam Marks	: 100

PART - A**UNIT-1**

Tolerances, Limits & Fits: General Tolerances, Tolerance grades, Limits fundamental deviation, Fits, Tolerance Accumulation cumulative effect of tolerances in assembly. Relationship between attainable tolerance grades and different machining processes.

06 Hours

UNIT-2

Geometric Tolerances: Geometrical characteristics and symbols. Definition and Measurement of circularity, cylindricity, flatness and runout. True position tolerance.

Surface Roughness : Terminology, Terms used for surface roughness, measurement of surface roughness. Surface roughness values obtained from various machining processes.

08 Hours

UNIT-3

Cumulative Effect Of Tolerances: sure fit law and truncated normal law. Selective assembly and interchangeable part manufacture, Control of axial play by introducing secondary machining processes and by adding laminated shims.

06 Hours

UNIT-4

Statistical Quality Control: Frequency distribution, standard deviation concept of skewness & Kurtosh variance, Process capability, Indices C_p and C_{pk} control charts.

06 Hours

PART – B

UNIT-5

Component Design From Casting Considerations: Pattern, Mould, Parting line, cored holes and machined holes, Design for reducing/eliminating sand cores.

06 Hours

UNIT-6

Component Design From Machining Consideration: Design considerations for turning, drilling, tapping, milling and grinding operations, provisions for clamping, Reduction in machining area, simplification by separation and amalgamation, Use of productive machines.

06 Hours

UNIT-7

Design Considerations: Major Design Phases. Design for Manufacturability consideration. Influence of Fabrication properties (Machinability, Castability, Weldability, Polymer processing).

07 Hours

UNIT-8

Selection Of Materials In Design: Properties of Materials used in design. Material selection process – cost per unit property, weighted properties and limits on properties methods.

07 Hours

TEXT BOOKS:

1. **Design for Manufacture**, Harry Peck, Pitman Publications, 1983.
2. **Engineering Metrology**, R.K. Jain Khanna Publishers, 2000.

REFERENCE BOOKS:

1. **ASM Handbook, vol.20**. Material selection & Design.
2. **Design for Manufacturability Handbook**, James G. Baralla, Editor, Mcgraw Hill 1998.
3. **Product Design for Manufacture and Assembly**, Geoffery Boothroyd et al 'Merck Dekker Inc. New York.
4. **Engineering Design: A Materials and Processing Approach**, George E. Dieter, Mcgraw Hill, 1991.
