

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Mechanical (Advance Manufacturing System) (Branch Code - 50)

Year – II (Semester – IV) (W.E.F. January 2014)

Subject Name: Quality Engineering in Manufacturing (745001)

Course Content:

Sr. No.	Module	Hours
01	Quality Value and Engineering: An overall quality system, Quality engineering in product design, Quality engineering in design of production processes, Quality engineering in production. Loss Function and Quality Level: Derivation and use of Quality Loss Function (QLF), Economic consequences of tightening tolerances as a means to improve quality, Evaluations and types tolerances - N-type, S-type and L-type.	(16 Hrs.)
02	Analysis of Variance (ANOVA): One-way ANOVA, Two-way ANOVA, Critique of F-test, ANOVA for four level factors, multiple level factors.	(12 Hrs.)
03	Orthogonal Arrays: Introduction to OA, Degrees of Freedom, Structure of OA, Linear Graphs & Interaction tables, Strategies in Experimentation - Typical test strategies, Better test strategies & Efficient test strategies, Steps in designing, conducting and analyzing an experiment. Interpolation of Experimental Results: Interpretation methods, Percent contribution, Estimating the mean.	(16 Hrs.)
04	Tolerance Design and Tolerancing: Functional limits, Tolerance design for N-type, L-type and S-type characteristics, Tolerance allocation for multiple components. Parameter and Tolerance Design: Introduction to parameter design, Signal to noise ratios, Parameter design strategy, Some of the case studies on parameter and tolerance designs.	(16 Hrs.)
05	Quality Tools: ISO-9000 Quality System, Business Process Re-engineering (BPRE), Six-sigma, Bench making, Quality circles, Brain Storming, Fishbone diagram.	(12 Hrs.)

Text Books:

1 . Taguchi Techniques for Quality Engineering /Phillip J. Ross/ McGraw Hill, Intl. II Edition, 1995.

References:

1 . Quality Engineering in Production systems / G. Taguchi, A- Elsayed et al / McGraw Hill Intl. Edition, 1989.

2. Taguchi Methods explained: Practical steps to Robust Resign / Tapan P. Bagchi /Prentice Hall Ind. Pvt. Ltd., New Delhi.