MA849 Six Sigma Methodology 4 0 0 4

Unit I Introduction to Quality Improvement
Quality Circles, Total quality management definitions – PDCA cycle quality circle tools – old and new QC tools –Statistical Thinking - Motorola's Six Sigma.

Unit II: Define and Measure tools
Six Sigma overview and the DMAIC principle – process mapping – quality function deployment – failure mode effects analysis – team development for organizational effectiveness – Six Sigma metrics based on normal distribution – evaluation of defect rates – parts per million(PPM) and defects per million opportunities (DPMO) – process capability analysis – measurement system analysis.

Unit III: Analyze and Improvement tools
Statistical thinking – hypothesis testing and confidence intervals – correlation analysis – multivariate and regression analysis – customer complaints analysis.Analysis of variance – one-way and two-way ANOVA – design of experiments – factorial experiments – response surface methodology – Taguchi techniques – loss functions- orthogonal arrays and experiments.

Unit IV: Control
Control plans – mistake proofing – special applications – discrete parts and continuous processes – control charts and administration - statistical process control charts – tolerencing.

Unit V: Design for Six Sigma and Lean Manufacturing
Reliability improvement tools – life test distributions – exponential – gamma – lognormal – Weibull distributions - life data analysis – Lean manufacturing tools

References:

1. *Harry, M and Schroeder R., Six Sigma: The Breakthrough Management Strategy. Currency Publishers, USA. (2000).*
2. Siddiqui,N.A and AbhishekDwivedi, " Introduction to six sigma: methods approaches and applications ,New age international publications,2017.
3. Taghizadegan, Salman , " Essentials of lean six sigma" , Elsevier2006.
4. *Montgomery D. C. (2005) Introduction to Statistical Quality control, 5th edition, Wiley.*
5. *Ravichandran, J. Probability and Statistics for engineers, First Reprint Edition, Wiley India, 2012.*
6. *Taguchi G, Introduction to Quality Engineering: Designing Quality into Products and Processes, Asian Productivity Organization, Second Edition. (1991).*