

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (QPM)

Semester: II

Syllabus with effect from: December - 2014

Paper Code: QP - 201	Total Credit:
Title Of Paper: Statistical Quality Control & Reliability	

Unit	Description in Detail	Weightage (%)
I	The meaning of quality and quality improvement, dimensions of quality, Quality engineering terminology, A brief history of quality methodology, The link between quality and productivity, quality costs, Legal aspects of quality. Brief discussion on Seven QC tools.	[8]
II	Statistical Basis of Control Charts: Basic Principles, Choice of Control limits, Sample size sampling frequency, rational subgroups, analysis of pattern on control charts, discussion on sensitizing rules for control charts. Control Charts for Variable: \bar{X} and R chart, and \bar{X} and R chart. The S2 control chart: OC function, ARL0 and ARL1, Average time to signal(ATS), Expected number of individuals sampled(I). Control charts for individual measurements Control Charts for Attributes: p, np, c and u charts.	[12]
III	Acceptance Sampling plans: Single, double & multiple sampling plans for attribute. Curtailed double sampling plans. Operating characteristic functions & other properties of the sampling plan. Use of sampling plans for rectification. Designing sampling plans. Dodge-Romig acceptance sampling plans. Acceptance sampling plan for variables with single & double specification limits. Designing variable acceptance sampling plans. AQL based sampling plans. Continuous sampling plans CSP-I & CSP – II.	[8]
IV	Elements of Reliability: Binary coherent structure, min path/cut sets/paths, lower/upper bounds for reliability functions, k-out-of-n:G, bridge structures. Reliability availability of one unit system supported by one repair facility and one standby. Hazard Rate/Failure Rate, Cumulative Hazard Rate Reliability Function. Properties of Hazard Rate. Classification of life distribution with respect to failure rate, failure rate average. Exponential, Gamma and Weibull life distributions.	[12]

Basic Text & Reference Books:-

- Montgomery, D. C. (1985) Introduction to Statistical Quality Control.(Wiley)
- Barlow R. E. & Proschan F. (1975) Statistical Theory of Reliability & Life testing. Holt, Rinehart & Winston Ins.

