

PCMF4402 STATISTICAL QUALITY CONTROL & RELIABILITY (3-0-0)

MODULE -I

(12 hours)

STATISTICAL QUALITY CONTROL: Methods and Philosophy of Statistical Process Control - Control Charts for Variables and Attributes - Cumulative sum and Exponentially weighted moving average control charts - Other SPC Techniques – Process - Capability Analysis - Six sigma concept.

ACCEPTANCE SAMPLING : Acceptance Sampling Problem - Single sampling plans for attributes – double sampling - multiple sampling - sequential sampling - Military standards - The Dodge Roming sampling plans – Random sampling.

MODULE –II

(13 hours)

RELIABILITY ENGINEERING: Definition of reliability – Performance and reliability - Reliability requirements – Life Testing - System life cycle – Mean time between failures – Mean time to failure - Mortality Curve - Availability – Maintainability.

FAILURE DATA ANALYSIS: Statistical failures of components – failure distributions – Bath tub curve – Negative exponential distribution – Normal distribution - log normal distribution – Gamma distribution - Weibull distribution Life distribution measurements – Accelerated life tests - Data requirements for reliability.

MODULE –III

(10 hours)

RELIABILITY PREDICTION AND MANAGEMENT:

Failure rate estimates - Effect of environment and stress - Series and Parallel systems - RDB analysis – Standby Systems - Complex Systems - Reliability demonstration testing - Reliability growth testing - Duane curve - Risk assessment – FMEA and Fault tree analysis.

TEXT BOOKS

1. Khanna, O.P., Statistical Quality Control, Dhanpat Rai Publications (P) Ltd., 2001.
2. Lewis, E.E., Introduction to Reliability Engineering, John Wiley and Sons, 1987.

REFERENCES

1. Mohamed Zairi, "Total Quality Management for Engineers ", Woodhead Publishing Limited 1991.
2. Harvid Noori and Russel, " Production and Operations Management - Total Quality and Responsiveness ", McGraw-Hill Inc, 1995.
3. Douglas C. Montgomery, " Introduction to Statistical Quality Control ", 2nd Edition, John Wiley and Sons, 1991.
4. Klaassen , H.B. and Van Peppen, J.C.L., System reliability concepts and applications, Edward Arnold, 1989.