MERCURY

Decision Making using Statistical Process Control SPC Course

4 – 8 October 2027
Kigali (Rwanda)



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Ref: 1149_1083552 **Date:** 4 – 8 October 2027 **Location:** Kigali (Rwanda) **Fees:** 5300 Euro

Introduction to Statistical Process Control

Quality and productivity are the lifelines of any industry in the global economy, with customers consistently seeking assurance that products and services adhere to optimal standards of quality.

Statistical Process Control SPC plays a pivotal role in quality management by offering objective evidence to manage and oversee the performance of manufacturing processes and the quality of final products.

Managers responsible for product or service development need a thorough understanding of statistical tools for SPC analysis to monitor process output that impacts quality.

They must also be equipped with quantitative reasoning skills to interpret statistical process control findings or evaluate interpretations made by others effectively.

Targeted Groups

- Managers, supervisors, and team leaders.
- Professionals in management support roles.
- Analysts who engage with data/analytical information in their work.
- Individuals seeking to enhance decision-making through data analytics.

Course Objectives

Upon completing this statistical process control certification course, participants will be able to:

- Grasp the concept, sources, and methods of measuring variation in work processes.
- Recognize the significance of data quality in SPC and SPC data analysis.
- Reassert the relevance of a normal distribution in applying SPC statistical process control techniques.
- Explore various control charts tailored for SPC programs and understand their use in different SPC processes.
- Utilize statistical tools to analyze quality control data effectively.
- Translate statistical outcomes into substantial management initiatives.
- Comprehend the concept, objective, and measurement of process capability.

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Targeted Competencies

- Leveraging data analytics in management.
- Importance and use of data in SPC data analytics.
- Implementation of data analytical methodologies through practical examples.
- Emphasis on management's interpretation of statistical evidence.
- Assimilation of statistical thought into day-to-day operations.

Course Content

Unit 1: Setting the Statistical Scene for SPC

- Overview of SPC and its significance in quality control.
- Fundamentals of Process Analysis Quality-Variation Relationship.
- SPC in the Six Sigma framework.
- Roles of statistics and data analysis in quality management.
- Data categorization Variable/Attribute and the necessity of Data Quality.
- Introduction of basic statistical concepts and tools of relevance to SPC.
- Summary tables and graphs.
- Examine the distribution of data using summary tables and graphs.
- Frequency distributions and histograms.
- One-way and two-way pivot tables; breakdown tables.
- Simple, multiple, and stacked bar charts.
- "Pareto" charts.
- Descriptive statistical measures.
- Central location, quartiles, percentiles, dispersion, and skewness.
- Box plots and categorized box plots.
- The average probability distribution z statistics.
- Hands-on Excel analysis using essential statistical tools on QC datasets.

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Unit 2: Review of SPC Tools

- Framework of SPC tools terms and definitions.
- Sub-group formation.
- Control charts types, data requirement, importance, methodology, benefits/advantages, interpretation, uses, and applications.
- Each control chart will be examined under the following headings: purpose/uses/data/methodology/computation/interpretation/application.
- Variable control charts for continuous data measures.
- Subgroups samples of data review purposes.
- Xbar chart Shewhart sample mean process location.
- R chart Shewhart sample range process variability/stability.
- Sigma chart standard deviation plot process variability/stability.
- CUSUM chart cumulative sum location trend tracking.
- EW moving average charts location trend tracking.
- Excel analysis of sample datasets for each Control Chart type.

Unit 3: Review of SPC Tools continued

- Control Charts for individual data.
- X chart Shewhart individual "x's".
- IX/MR charts individual "x's" and moving range variability tracking.
- Attribute control charts for discrete/countable data measures.
- P chart sample proportion defective based on a Bernoulli process.
- NP chart sample number of defectives i.e., Bernoulli process.
- C chart sample number of defectives per sub-group Poisson process.
- U chart orc bar chart sample number of defects per unit
- Excel analysis of sample datasets for each control chart type.

Unit 4: Validity Tests and Process Capability

- Tests and conditions of valid SPC analysis.
- Control chart assumptions regular pdf; independence.
- Curve fitting normal distribution K-S hypothesis test for Normality.
- Run chart and test rules.
- Process capability analysis.
- Overview of process capability analysis Evans/Olson p155/156.
- Process capability index Cp.
- Process performance index Cpk.
- Using Excel to analyze sample datasets for validity tests and process capability.

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Unit 5: More Advanced Statistical Tools in SPC

- Statistical methods to make inferences about process behavior
- Sampling and sampling distributions.
- Confidence limits - use and interpretation.
- Hypothesis tests t-test: two-sample test of means - use and interpretation.
- Analysis of variance ANOVA - use and interpretation.
- Regression analysis scatter plots; correlations.
- Excel analysis of sample datasets to illustrate each of the Statistical Tools in SPC.
- "How to integrate SPC into the work domain."

SPC Certification and Training

The statistical process control course includes advanced SPC training and encourages participants to achieve SPC certification. This acknowledgment is a testament to their proficiency in SPC data analytics and statistical process control techniques.

Becoming Process Control Savvy

Gain in-depth knowledge and hands-on experience with SPC certification training programs. Participants will learn to interpret statistical data and make informed decisions that can significantly impact the quality and efficiency of their operational processes.

Advancing Your Skills with Advanced SPC

Advanced statistical process control topics and in-depth case studies will be covered for those ready to take their expertise to the next level. This advanced SPC course will enhance your skill set, preparing you for more complex challenges and roles within quality management.

Enroll in our Statistical Process Control SPC Course to refine your quality management skills and advance your career with practical knowledge and certification.