



IE283: Mastering Statistical Control Charts for Quality Improvement

Training Description:

This intensive training course provides a comprehensive understanding of Statistical Process Control (SPC) with a focus on control charts. Participants will gain hands-on experience in selecting, designing, interpreting, and using control charts to monitor and improve processes. The training course balances theoretical foundations with real-world application and case studies from manufacturing, services, and healthcare sectors.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand the principles of variation and process control
- ✓ Choose the correct type of control chart for various data types
- ✓ Construct and interpret different control charts
- ✓ Identify special and common causes of variation
- ✓ Use control charts to support quality improvement initiatives
- ✓ Apply control chart rules to detect out-of-control conditions
- ✓ Implement control charts in software tools such as Excel, Minitab, or Python

Training Designed for:

This training course is intended for Quality Engineers and Managers, Process Engineers, Manufacturing Supervisors, Six Sigma Green/Black Belts, Data Analysts working with process data, Operations and Production Managers and Anyone involved in process improvement or SPC implementation.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ **Foundations of Statistical Process Control**
 - Introduction to Statistical Process Control (SPC)
 - Understanding Variation: Common vs. Special Causes
 - History and Evolution of Control Charts
 - The Role of Control Charts in Quality Management (e.g., Deming, Shewhart)
 - Introduction to the Plan-Do-Check-Act (PDCA) cycle
 - Overview of Types of Control Charts
- ❖ **Exercises:**
 - Variation simulation exercise (e.g., Red Bead Experiment)
 - Group discussion on real-world variation issues
 - Quiz: Types of Variation and SPC history

DAY TWO:

- ❖ **Variable Control Charts ($\bar{X}$ -R, $\bar{X}$ -S Charts)**
 - Data types: Variable vs. Attribute
 - Central Limit Theorem and its role in SPC
 - $\bar{X}$ and R Charts: Construction, Interpretation, and Applications
 - $\bar{X}$ and S Charts for large samples
 - Calculating control limits using real data
 - Rational Subgrouping
- ❖ **Exercises:**
 - Hands-on construction of $\bar{X}$ -R charts (manual and software)
 - Case Study: Machine performance over time
 - Workshop: Selecting rational subgroups

DAY THREE:

- ❖ **Attribute Control Charts (p, np, c, and u Charts)**
 - Counting Defects vs. Defective Items
 - p and np Charts (proportion and count of defective units)
 - c and u Charts (count and rate of defects per unit)
 - Assumptions: Binomial and Poisson distributions
 - Applications in service and transactional processes
- ❖ **Exercises:**
 - Building and interpreting attribute charts using Excel/Minitab
 - Case Study: Call center defects and hospital readmission rates
 - Interactive game: Matching process types with control chart types

DAY FOUR:

- ❖ **Advanced Topics and Interpretation Rules**
 - Western Electric Rules and Nelson Rules
 - Identifying non-random patterns and trends
 - Short-run SPC and Individual-Moving Range Charts (I-MR)
 - Process Capability vs. Process Control
 - Misuse and Misinterpretation of Control Charts
 - Handling non-normal data
- ❖ **Exercises:**
 - Practice: Detecting signals in control charts
 - Scenario analysis: What action would you take?
 - Software lab: I-MR chart construction and analysis

DAY FIVE:

- ❖ **Implementation, Case Studies, and Assessment**
 - Selecting the right chart for the process
 - Integrating control charts into quality systems
 - Organizational challenges and change management
 - Real-world case studies (manufacturing, healthcare, finance)
 - Review of key concepts and best practices
- ❖ **Exercises:**
 - Final project: Build and present a control chart for a process
 - Group discussion: Lessons learned and next steps

- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Group and Corporate Discounts:

- We offer group and corporate discounts on many courses. These discounts are available for clients who want to maximize their return on investment.

Individual Discounts:

- We offer individual discounts on many courses for people who are self-sponsored and make their payment in full and upfront at the time of registration

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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