Advanced SPC with Minitab Training Course

Professional Development Training Course Outline

Category	Quality Assurance and ISO standards	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Statistical Process Control (SPC) is a powerful methodology used across industries to monitor, control, and improve processes through data-driven decision-making. Advanced SPC with Minitab Training Course is designed to provide participants with a comprehensive understanding of advanced quality tools, data analytics, and statistical techniques using Minitab software. With growing emphasis on digital transformation, process optimization, and predictive quality, this course equips professionals with skills that align with global industry best practices.

By integrating SPC principles with advanced Minitab functions, participants will learn to analyze variability, predict process capability, and implement data-driven continuous improvement strategies. The course blends real-world applications, case studies, and simulation exercises to ensure participants are industry-ready. With SPC becoming a trending necessity in manufacturing, healthcare, IT services, and supply chains, this course strengthens organizational performance by reducing defects, ensuring compliance, and achieving operational excellence.

Programme Curriculum

Advanced SPC with Minitab Training Course

Introduction

Statistical Process Control (SPC) is a powerful methodology used across industries to monitor, control, and improve processes through data-driven decision-making. Advanced SPC with Minitab Training Course is designed to provide participants with a comprehensive understanding of advanced quality tools, data analytics, and statistical techniques using Minitab software. With growing emphasis on digital transformation, process optimization, and predictive quality, this course equips professionals with skills that align with global industry best practices.

By integrating SPC principles with advanced Minitab functions, participants will learn to analyze variability, predict process capability, and implement data-driven continuous improvement strategies. The course blends real-world applications, case studies, and simulation exercises to ensure participants are industry-ready. With SPC becoming a trending necessity in manufacturing, healthcare, IT services, and supply chains, this course strengthens organizational performance by reducing defects, ensuring compliance, and achieving operational excellence.

Course Objectives

1. Understand advanced concepts of Statistical Process Control (SPC).
2. Apply Minitab software tools for advanced process analysis.
3. Develop data-driven strategies to minimize variation.
4. Interpret and evaluate control charts for complex processes.
5. Conduct capability analysis for process improvement.
6. Perform advanced hypothesis testing in Minitab.
7. Utilize multivariate analysis for correlated data sets.
8. Apply regression and correlation analysis in quality control.
9. Integrate SPC with Lean Six Sigma methodologies.
10. Conduct root cause analysis using Minitab functions.
11. Develop predictive models for process optimization.
12. Implement SPC in compliance with ISO and industry standards.
13. Create interactive dashboards and reports for decision-making.

Organizational Benefits

- Enhanced process efficiency and reduced variability.
- Improved customer satisfaction and compliance with global standards.
- Increased operational excellence through data-driven decisions.
- Reduced rework, waste, and cost of poor quality.
- Strengthened predictive capability for critical processes.
- Better integration of SPC with Lean and Six Sigma projects.
- Improved cross-functional team collaboration using Minitab outputs.
- Enhanced culture of continuous improvement within the organization.
- Faster identification of root causes of process inefficiencies.
- Measurable ROI through optimized quality performance.

Target Audiences

- Quality Engineers
- Process Engineers
- Manufacturing Supervisors
- Continuous Improvement Specialists
- Six Sigma Practitioners
- Operations Managers
- Data Analysts in Quality Management
- Professionals preparing for ISO or regulatory compliance

Course Duration: 10 days

Course Modules

Module 1: Introduction to Advanced SPC and Minitab

- Evolution of SPC in modern industries
- Advanced quality improvement principles
- Introduction to Minitab workspace and tools
- Linking SPC with data-driven decision-making
- Advanced data collection methods
- Case Study: SPC application in an automotive production line

Module 2: Control Charts for Variables Data

- Advanced X-bar and R charts
- Individuals and Moving Range charts
- Process stability and interpretation techniques
- Designing control charts in Minitab
- Rules for detecting special cause variation
- Case Study: Monitoring machine calibration with control charts

Module 3: Control Charts for Attribute Data

- P-charts and NP-charts application
- C-charts and U-charts for defect tracking
- Choosing appropriate charts for discrete data
- Attribute chart interpretation in Minitab
- Case study comparisons for multiple industries
- Case Study: Reducing defect rates in packaging operations

Module 4: Process Capability Analysis

- Cp, Cpk, Pp, and Ppk indices explained
- Process capability studies in Minitab
- Non-normal data capability analysis
- Benchmarking against industry standards
- Linking process capability to Six Sigma goals
- Case Study: Capability analysis in a food production plant

Module 5: Advanced Hypothesis Testing with Minitab

- Two-sample t-tests and ANOVA
- Chi-square tests for categorical data
- Non-parametric methods in Minitab
- Selecting appropriate hypothesis tests
- Avoiding Type I and Type II errors
- Case Study: Testing material strength across suppliers

Module 6: Regression and Correlation Analysis

- Simple linear regression in SPC
- Multiple regression models in Minitab
- Correlation analysis for process relationships
- Predictive modeling for continuous improvement
- Residual analysis and interpretation

- Case Study: Predicting process output in electronics manufacturing

Module 7: Design of Experiments (DOE)

- Introduction to DOE concepts
- Full factorial design in Minitab
- Fractional factorial experiments
- Analyzing DOE results for optimization
- DOE in continuous improvement projects
- Case Study: DOE in optimizing chemical process parameters

Module 8: Multivariate Analysis

- Principal Component Analysis (PCA)
- Cluster analysis in Minitab
- Multivariate control charts
- Applications in correlated process variables
- Benefits of multivariate monitoring
- Case Study: Multivariate analysis in pharmaceutical production

Module 9: Measurement System Analysis (MSA)

- Gage R&R study in Minitab
- Attribute agreement analysis
- Sources of measurement variation
- Designing MSA for high accuracy
- Best practices in measurement systems
- Case Study: Measurement system analysis in precision machining

Module 10: Root Cause Analysis Using Minitab

- Pareto analysis in Minitab
- Fishbone diagrams integrated with SPC
- Advanced cause-and-effect analysis
- Data stratification methods
- Identifying and eliminating root causes
- Case Study: RCA in reducing downtime in manufacturing

Module 11: SPC and Lean Six Sigma Integration

- Linking SPC tools with Lean methodology
- DMAIC and SPC synergy
- Reducing waste with SPC insights
- Real-world Lean Six Sigma projects using Minitab
- Sustainability of process improvements
- Case Study: Lean Six Sigma integration in logistics

Module 12: SPC in Service Industries

- SPC application in healthcare
- SPC in IT and software services
- SPC in supply chain management

- Challenges of applying SPC in non-manufacturing sectors
- Strategies for service quality improvement
- Case Study: SPC in reducing hospital readmission rates

Module 13: Advanced Data Visualization and Reporting

- Interactive dashboards in Minitab
- Customizing reports for stakeholders
- Real-time SPC reporting tools
- Data storytelling with Minitab outputs
- Automating reporting processes
- Case Study: Visualization for management in energy sector

Module 14: Compliance and Standards with SPC

- SPC and ISO standards
- FDA and GMP compliance with SPC
- Aligning SPC practices with global benchmarks
- Documentation and auditing with Minitab
- Regulatory challenges and solutions
- Case Study: SPC for regulatory compliance in food industry

Module 15: Capstone Project and Case Study Integration

- Consolidated project applying all SPC tools
- Real-world case simulation with Minitab
- Collaborative project presentation
- Data-driven solutions for process challenges
- Continuous improvement roadmap development
- Case Study: End-to-end SPC implementation in manufacturing

Training Methodology

- Instructor-led interactive lectures
- Hands-on practice with Minitab software
- Group exercises and role-play sessions
- Real-life case studies and simulations
- Continuous assessments and feedback loops

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com