Laboratory Statistical Quality Control for Testing Training Course

18 – 22 April 2027
Muscat

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Training Center

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Ref: 870_165755 **Date:** 18 – 22 April 2027 **Location:** Muscat **Fees:** 5700 Euro

Overview

Laboratory Statistical Quality Control for Testing Training Course is a one-week course for analysts, quality specialists, mineral testing teams, environmental testing teams, and technical managers who leave with a Laboratory Statistical QC Decision Pack. Participants connect sampling variation, descriptive statistics, method performance, control charts, detection capability, uncertainty, and proficiency evidence. The course resolves inconsistent result review by linking statistical signals to documented laboratory actions. Agile Leaders Training Center develops laboratory statistical quality-control practice.

Who Should Attend

- Laboratory functions responsible for producing and reviewing mineral or environmental test results
- Quality functions responsible for statistical controls, exceptions, and corrective actions
- Method functions responsible for precision, bias, recovery, and detection capability
- Technical management functions responsible for data quality and laboratory performance
- Proficiency functions responsible for interlaboratory comparison and result interpretation

The course assumes participants work with numerical laboratory results and routine quality-control samples; it leaves out instrument operation, accreditation preparation, advanced statistical programming, and method-specific chemistry.

Departments and Industries

The course supports departments and industries that depend on defensible analytical measurements.

- Mineral analysis, mining services, metallurgy, and geochemical laboratories
- Environmental, water, soil, air, and waste testing functions
- Industrial quality, research, process, and contract laboratories
- Technical assurance, laboratory management, and data-review functions

Learning Objectives

By the end of this course, participants will be able to:

- Analyze sampling, measurement, and method variation in laboratory data.
- Build descriptive summaries and control charts with action rules.
- Evaluate precision, bias, recovery, and detection capability evidence.
- Diagnose outliers, trends, shifts, and assignable causes.
- Compare uncertainty and interlaboratory performance evidence.
- Prioritize actions in a laboratory statistical QC decision pack.

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Course Agenda

Day 1: Structure Laboratory Variation

- Sampling and Measurement Process Map
- Random and Assignable Cause Classification
- Data Type, Scale, and Distribution Checklist
- Mean, Spread, and Robust Summary Calculator
- Laboratory Data Quality Screening Log

Day 2: Monitor Statistical Control

- Check Standard and Control Sample Design
- Shewhart Center Line and Control Limit Worksheet
- Range and Standard Deviation Chart Selection
- Trend, Shift, and Action Signal Rules
- Out-of-Control Investigation Record

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Day 3: Evaluate Method Performance

- Repeatability and Intermediate Precision Study
- Bias, Recovery, and Reference Value Comparison
- Detection and Quantification Capability Review
- Outlier Assessment and Retention Decision
- Method Performance Evidence Matrix

Day 4: Compare Laboratory Evidence

- Measurement Uncertainty Evidence Map
- Interlaboratory Comparison Data Preparation
- ISO 13528 Performance Score Interpretation
- Proficiency Result and Root-Cause Review
- Statistical Finding and Corrective Action Register

Day 5: Practice Laboratory QC Decisions

- Exercise: Screen Mineral and Environmental Data
- Exercise: Build and Interpret Control Charts
- Exercise: Review Precision, Bias, and Detection Evidence
- Exercise: Diagnose Proficiency and Uncertainty Findings
- Capstone: Laboratory Statistical QC Decision Pack

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Practical Exercises

The course uses suggested activities based on mineral, water, soil, and industrial laboratory cases.

- Suggested activity: summarize replicate and control-sample results and flag data-quality concerns.
- Suggested activity: construct a control chart and document the response to an action signal.
- Suggested activity: compare precision, bias, recovery, and detection evidence for a test method.
- Suggested activity: interpret an interlaboratory result and prioritize a traceable corrective action.

FAQs

Who suits laboratory statistical quality control training, and what does it assume?

Analytical, quality, method, proficiency, and technical management functions suit the training. It assumes regular work with numerical results and routine quality-control samples.

How does laboratory statistical quality control differ from general quality management training?

Laboratory statistical quality control focuses on measurement variation, method evidence, control charts, and result decisions, while general quality management addresses wider processes, systems, audits, and organizational controls.

What do control charts show in laboratory statistical quality control?

Control charts show whether a measurement process remains stable around a center line and whether points, trends, or shifts signal a cause that requires investigation.

How are precision and bias used in laboratory data quality?

Precision describes variation among repeated results, while bias compares results with a reference or expected value; both provide evidence for judging method performance and result fitness.

How does proficiency testing support laboratory statistical quality control?

Proficiency testing compares laboratory results with assigned or peer evidence, helping teams evaluate performance, investigate unusual scores, and confirm whether corrective action is needed.

Conclusion

Participants take back a Laboratory Statistical QC Decision Pack containing variation summaries, control charts, method-performance evidence, outlier decisions, uncertainty records, proficiency findings, and corrective actions. It changes isolated statistical calculations into a traceable laboratory review process. The pack supports consistent signals, documented investigations, and defensible decisions for mineral and environmental test data.