MERCURY

Laboratory Competence and Quality to ISO/IEC 17025:2017

7 – 11 February 2027
Manama (Bahrain)



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Laboratory Competence and Quality to ISO/IEC 17025:2017

Ref: 121368_1029721 **Date:** 7 – 11 February 2027 **Location:** Manama (Bahrain) **Fees:** 4900 Euro

Laboratory Competence and Quality to ISO/IEC 17025:2017 is a 1-week course for analysts, technical supervisors and reviewers who must show that every reported result is technically valid. You work through method validation, measurement uncertainty, metrological traceability and result monitoring, and you take back a Method Validity Dossier for one of your own methods. Mercury Training Center delivers this ISO/IEC 17025:2017 lab competence course.

About This Course

Assessors and clients ask less about manuals and more about the evidence behind each number: how a method was verified, how large its uncertainty is and how values stay traceable. To follow the course you should already run or review measurements at the bench. You practice on worked data sets and build the dossier as you go.

Who It Is For

- Analysts who run measurements and sign off raw data.
- Technical supervisors who approve methods and authorize staff to report results.
- Staff who plan internal checks, proficiency rounds and control charts.
- Metrology staff who look after reference standards, instruments and their traceability.
- Technical reviewers who check reports and statements of conformity before release.

This course is not for readers who need to build a whole lab framework from the start, who are better served by a longer implementation course, nor for readers who mainly want to audit labs, who suit a dedicated internal auditor course.

Competencies You Will Build

- Method Fitness Judgement: you choose between verification and full validation and record why the method fits its intended use.
- Validation Study Design: you plan trials for bias, precision, working range, detection limit and robustness.
- Uncertainty Budgeting: you list contributions, combine them and state an expanded uncertainty.
- Traceability Mapping: you follow each reported value back through instruments and reference materials to the SI.
- Result Monitoring: you run control charts, replicates and proficiency rounds and act on warnings.
- Staff Authorization: you define, observe and record the skills a person needs before reporting a method.

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What You Will Be Able to Do

By the end of the course you will be able to:

- Using clause 7.2 of ISO/IEC 17025:2017, decide whether a method needs verification or validation and draft its plan.
- Given replicate and spiked-sample data, calculate bias, repeatability and intermediate precision and judge them against fitness criteria.
- From a measurement model, build an uncertainty budget following the GUM and report an expanded value with its coverage factor.
- Given instrument and reference material certificates, confirm an unbroken traceability chain and note any gap.
- Using control chart and proficiency z-score data, decide when a trend needs investigation.
- From a client request, apply a decision rule to a statement of conformity that accounts for uncertainty.

Course Content

Day 1: Technical Requirements Overview

- Structure of ISO/IEC 17025:2017 Clauses 6 and 7 for Bench Staff
- Impartiality and Confidentiality Duties When Handling Client Samples
- Personnel Competence Criteria and Authorization Records per Method
- Environmental Condition Monitoring for Sensitive Measurements
- Intermediate Checks of Instruments Between External Services

Day 2: Method Selection and Validation

- Verification Versus Validation for Standard and In-House Methods
- Eurachem Fitness for Purpose Guide Applied to Analytical Methods
- Bias and Recovery Studies Using Certified Reference Materials
- Repeatability and Intermediate Precision Trials for Routine Methods
- Detection Limit, Working Range and Robustness Experiments

Day 3: Measurement Uncertainty and Traceability

- GUM Approach to Writing a Measurement Model
- Type A and Type B Evaluation of Uncertainty Contributions
- Combined and Expanded Uncertainty with Coverage Factors
- Top-Down Uncertainty from Validation and Proficiency Data
- Metrological Traceability Chains for Instruments and Reference Materials

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Day 4: Assuring Valid Results

- Shewhart Control Charts for Check Samples and Blanks
- ISO 13528 z-Scores for Interpreting Proficiency Rounds
- Interlaboratory Comparisons and Replicate Runs on Retained Samples
- Decision Rules and Statements of Conformity in Client Reports
- Nonconforming Work Handling and Recall of Issued Results

Day 5: Practice Building the Method Validity Dossier

- Exercise: Validation Plan for a Water Analysis Method
- Exercise: Uncertainty Budget for a Pressure Gauge Measurement
- Exercise: Control Chart Review After a Proficiency Outlier
- Exercise: Competence Matrix for a Newly Assigned Analyst
- Completing the Method Validity Dossier for One of Your Methods

Case Studies and Exercises

These are suggested activities.

- Case study: spiked samples at a food analysis lab drift from the reference value; you decide whether bias or contamination is the cause and what to re-run.
- Case study: a construction materials lab receives a complaint about a concrete strength report; you check the press traceability and decide whether to recall the report.
- Exercise: two analysts at a petroleum products lab report different values for one sample; you separate repeatability from operator effect and set an authorization step.
- Exercise: an environmental lab receives an unsatisfactory proficiency z-score; you review its control charts and write the corrective action.

What You Take Back

The Method Validity Dossier is the evidence file you assemble for one of your own methods during the course. In your first month back, you use it to close gaps in that method's validation, issue its uncertainty statement and set the monitoring plan your technical reviewer signs.

- A validation or verification plan with a results summary.
- An uncertainty budget with expanded uncertainty and coverage factor.
- A traceability chain for instruments and reference materials.
- A result monitoring plan with control limits and proficiency rounds.

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Quick Answers FAQ

What should I know before Laboratory Competence and Quality to ISO/IEC 17025:2017 training?

You should already run, check or review measurements and be comfortable with means and standard deviations. Earlier contact with ISO/IEC 17025:2017 helps but is not required; the technical clauses are read together at the start.

How does ISO/IEC 17025:2017 technical competence training differ from an implementation or internal auditor course?

It concentrates on the evidence behind each result: validation, uncertainty, traceability and monitoring. Implementation courses run longer and build the whole framework, while auditor courses teach how to plan and conduct audits.

How do you estimate measurement uncertainty under ISO/IEC 17025:2017?

You write a measurement model, evaluate each contribution by statistics or other information, combine them and multiply by a coverage factor. Where a full model is impractical, validation and proficiency data can support a top-down estimate.

What do I take back from Laboratory Competence and Quality to ISO/IEC 17025:2017?

You take back the Method Validity Dossier for one of your methods: a validation plan, an uncertainty budget, a traceability chain and a monitoring plan.

For Your Manager

After the course, the team member can plan method validation, estimate measurement uncertainty, confirm traceability and monitor results against control limits. They return with a Method Validity Dossier for one of the lab's own methods, first used to close open validation gaps and prepare that method's evidence for the next technical review.