Specification of Competency Standards
for the Testing, Inspection and Certification Industry
Unit of Competency

Functional Area - Testing Operations

Title	Apply statistical calculations to measurement data
Code	105871L4
Range	This unit of competency (UoC) covers the abilities to apply appropriate statistical technique for analysing measurement data and determine the performance of quality assurance activities and method performance characteristics in a testing / calibration laboratory.
Level	4
Credit	2 （For Reference Only）
Competency	Performance Requirements 1. Possess knowledge of various statistical techniques for analysing measurement data • Master relevant scientific and technical terminology, e.g. variables, dispersion, central tendency, process control, process stability, normal distribution, confidence level, pooled precision and replication. • Describe principles, application and mathematical equations of statistical calculations such as t-test, Q-test, F-test, analysis of variance (ANOVA). • Specify requirements of statistical treatment defined in international standards and guidelines for relevant method performance characteristics and quality assurance activities. • Identify definitions and calculations of method performance characteristics such as repeatability, reproducibility, intermediate precision, pooled standard deviation, method bias, recovery, limit of detection and quantitation. 2. Apply statistical calculations to measurement data • Verify validity and adequacy of measurement data and information. • Reject invalid data using data acceptability tests. • Apply appropriate statistical technique to analyse valid measurement data based on intended purpose, e.g.: o regression and correlation coefficients for calibration curve, o pooled standard deviation for method precision, o significance tests, such as t-test, paired t-test, F-test, analysis of variance (ANOVA) for within or between laboratory comparison, method bias, recovery and measurement uncertainty, o data acceptability tests, such as Q, T and Youden test, o mean, standard deviation, probability for construction of control chart and frequency distribution plots, and evaluation of limit of detection and quantitation. • Establish criteria for quality control checks based on results of the statistical treatment. 3. Exhibit professionalism • Ensure statistical treatments of valid measurement data comply with industry practices.
Assessment Criteria	The integrated outcome requirements of this UoC are the abilities to: • determine appropriate statistical technique for analysing valid measurement data in compliance with international standards and intended purpose, • apply statistical calculations to analyse measurement data accurately, • establish method performance characteristics and criteria of quality assurance activities.
Remark	