

Fundamentals Of Metrology Overview

- I. Introduction & Overview –
 - a. Safety and Orientation
 - b. Agenda and Resources
 - c. Measurement Terminology
- II. Measurement Systems
 - a. International System of Units (SI) and Organizations You Should Know
 - b. Measurement Terminology
 - c. Good Laboratory Practices
 - d. Dimensional Analysis Review
- III. Laboratory Management & Quality Systems (ISO/IEC 17025)
 - a. Laboratory Workflow
 - b. Focus: Documents and Records (4.3, 4.13)
 - c. Focus: Auditing Process (4.10, 4.11, 4.12, 4.14)
 - d. Focus: Impacts to Measurement Variability (5.2, 5.3, 5.4, 5.5, 5.6)
- IV. Measurement Exercise (results to be integrated into remaining topics)
 - a. Laboratory “Scope”
 - b. Reviewing Specifications
 - c. Inspection of Laboratory Facility, Equipment, Standards, Procedure
 - d. Calibration Items – inspection, handling, tracking (5.8)
 - e. Measurements
- V. Traceability (5.6)
 - a. Definitions and Essential Elements
 - b. Application from Laboratory Measurements
 - c. Tools for assessing the laboratory
- VI. Statistics
 - a. More Terminology and Concepts
 - b. Measures of Central Tendency and Variation, Statistical Tools
 - c. Application from Laboratory Measurements
- VII. Measurement Assurance (5.9)
 - a. What it is and where it “fits” in the laboratory system
 - b. 4-step Process, Check Standards and Control Charts
 - c. Application from Laboratory Measurements
 - d. Tools for assessing the laboratory
- VIII. Uncertainties (5.4.6)
 - a. GUM
 - b. 8-step Process
 - c. Application from Laboratory Measurements
- IX. Proficiency Testing
 - a. Uses of Interlaboratory Comparisons
 - b. Statistical Tools
 - c. Application from Laboratory Measurements
- X. Software Verification and Validation
 - a. What it is and where it “fits” in the laboratory system
 - b. Tools for assessing the laboratory
- XI. Management Reviews (4.15)
 - a. What it is, where it “fits,” and benefits in the laboratory system
- XII. Calibration Reports (5.10)
 - a. Tools for assessing the laboratory
 - b. Application from Laboratory Measurements
- XIII. Final Exam