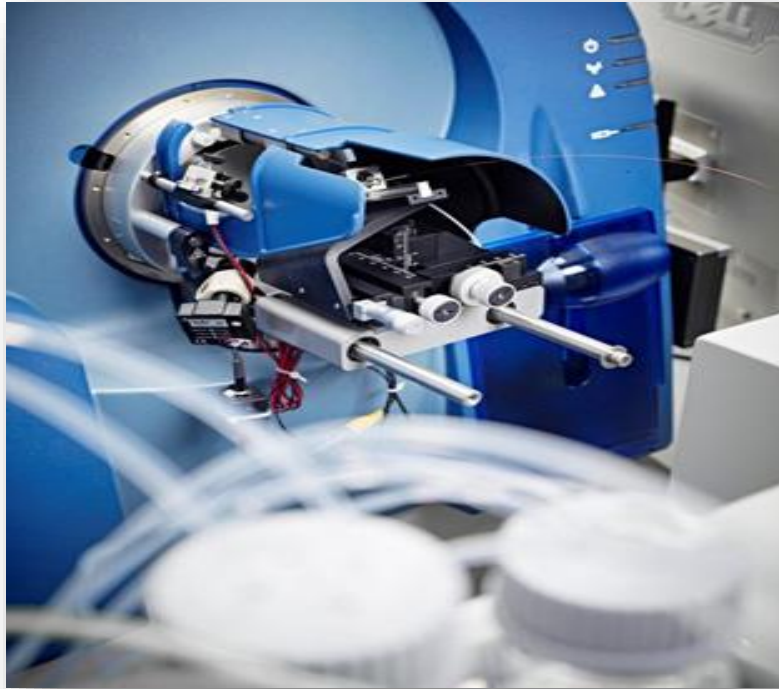




LAB003

Practical Statistical Analysis of Lab Data

Course Introduction:

This training course is designed to help the participants master the use of statistical techniques in analyzing laboratory and make proper judgments, conclusions and recommendation. In the laboratory environment, massive data is generated as a result of the continuing measurements, testing and calibration processes.

In this course participant will discover how to derive technically and managerially meaningful facts from the information gathered through their measurements and data collection programs. It presents quantitative and qualitative tools they can apply to analyze data obtained from measurements, daily reports, surveys and external data sources.

Participants will have the opportunity to apply the principles learned to actual problems through the use of illustrative case studies under the guidance of the instructor.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Define data categories that are relevant to lab functions
- ✓ Detect and eliminate outliers to assure data adequacy and integrity
- ✓ Summarize data for effective reporting and communication
- ✓ Carry out significance tests for different purposes
- ✓ Define what statistical test to use
- ✓ Explain the impact of sample size on statistical significance and power
- ✓ Apply statistical process control charts to measurement processes
- ✓ Analyze and interpret data for making fact-based conclusions and effective decisions

Who Should Attend?

This course is intended for all Laboratory Technicians, Scientists, Laboratory Managers, R&D Managers, Research Supervisors, and others who need to learn and understand statistical methods of data analysis.

Course Outline:

Day 1:

Laboratory Data

- Laboratory Functions, Systems and Culture
- Laboratory's Role in Enterprise Performance
- Laboratory Quality Measures, Types of Data in Laboratory Environment, Managing Laboratory Information

- Assuring Quality in Laboratory Data
- Fundamentals, Dimensions and Determinants of Quality
- Data Types and Analysis Requirements in Laboratory Quality Management Standards

Day 2:

Statistical and Descriptive Categories of Data

- Categories of Data
- Data Collection Techniques and Tools
- Data Adequacy, Quality, Stability, and Integrity
- Statistical Terminology, Populations and Samples
- Descriptive and inferential Statistics
- Descriptive Statistics Central Tendency and Variation
- Concept and Measurement of Dispersion
- Statistical Histograms and Charts for Effective Graphical Data Display
- Estimation of Parameters, Proportions and Statistics

Day 3:

Statistical, Distributions, and Design on Laboratory

- Statistical Distribution
- Normal Distribution and Testing Normality Assumptions
- Associative Studies, Correlation and Analysis and Regression, Setting and Testing of Hypothesis
- Confidence Intervals
- Design of Experiments and the Analysis of Variance (ANOVA)

Day 4:

Measurement, Accuracy, Process, and Variable on Laboratory

- Measurement System Analysis
- Accuracy, Precision, Stability and Linearity
- Gage Repeatability and Reproducibility
- Concept of Stability and Capability
- Process and Capability Indicators- Short Term and Long Term, Process Capability Indicators – Potential and Actual, Interpreting Process Capability Value
- Statistical Process Control (SPC)
- Variable and Attribute Control Charts

Day 5:

Validation, Inter-Laboratory, Test Data, and Scoring and Analysis

- Validation Methods, Validation Using Statistical Process Control, Measurement Uncertainty Calculations
- Inter-Laboratory Studies and Proficiency Testing
- Scoring and Analysis of Proficiency Test Data
- Understanding Z-Scores in Proficiency Testing and Making the Proper Decisions, Data for Measuring Performance in Laboratory work and Establishing a Lab Scorecard

Course Fees:

To be advised as per course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request".

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

