

Basic statistics for QC Laboratories

This module covers some essential and practical statistical techniques necessary if you work in a laboratory. You will learn when and how to apply techniques to data presentation, analysis and interpretation.

Objectives:

- Present data and results in the most appropriate way, with the correct number of significant figures
- Understand and use attribute and variable data
- Conduct basic laboratory statistical tests
- Use the outliers test to determine whether to accept or reject certain data

Course Outline

IMPORTANT TERMS

- o Introduction
- o Important concepts

PRESENTATION OF DATA

- o Introduction
- o Describe and present data
- o Graphical presentation
- o Measures of location
- o Mean, median and mode
- o Bias (accuracy)
- o Range
- o Measures of variance
- o Coefficient of variation
- o Precision, accuracy, bias
- o Review

SIGNIFICANCE

- o Introduction
- o Significant figures
- o Specifications and reporting

TYPES OF DATA

- o Introduction
- o Attribute and variable data
- o Converting data
- o Normal distribution
- o Using normal distribution
- o Population and sample
- o Central Limit Theorem
- o Interpreting distributions
- o Parametric tests
- o Transforming data
- o Use of binomial distribution
- o Review

BASIC LABORATORY TESTS

- o Introduction
- o Selecting statistical tests
- o Hypothesis testing
- o Type I and Type II errors
- o Statistical significance
- o Assessing assay variances
- o F test
- o Single-sample t test I
- o Unpaired two-sample t test I
- o Paired two-sample t test
- o Examples
- o Confidence intervals
- o Selecting a sample size
- o Review

OUTLIERS TEST

- o Introduction
- o The outliers test
- o Using outliers test
- o Review

SUMMARY

- o Summary