DEFINE™
MANAGEMENT CONSULTANCY & TRAINING

Training Title

BEST PRACTICE OF STATISTICS METHOD AND MEASUREMENT & UNCERTAINTY OF CHEMICAL ANALYSIS

Training Duration

5 days

Training Dates & Venue

REF LM020	Best Practice of Statistics Method and Measurement Uncertainty Of Chemical Analysis	5	15-19 November, 2021	$6,500	Amsterdam, Netherlands

In any of the 5 star hotels. The exact venue will be informed once finalized.

Training Fees & Date

- **6,250 US$ per participant for Public Training includes Materials/Handouts, International Buffet Lunch, Tea/Coffee Refreshments.**

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

Majority of modern instruments in the laboratory is computerized and provide incredible amounts of data. Methods that take advantage of the flood of data are now available; importantly they do not emulate 'graph paper analyses' on the computer. Practical Data Analysis in Chemistry exemplifies every aspect of theory applicable to data analysis using a short program or excels spreadsheet. The quantitative chemical measurement has linked with it an uncertainty in the result, which is determined by the performance characteristics of the analytical method used. Measurement uncertainty has often been evaluated on the basis of repeatability and reproducibility data, but the measurement uncertainty, as expressed in the "Guide to the Expression of Uncertainty in Measurement" published by ISO in 2005 goes further and gives general rules for the evaluation of measurement uncertainty based on both statistical and non-statistical uncertainties.

This is an extremely practical course for laboratory employees who want to know how to use data analysis and interpretive methods from statistical theory. The most commonly used mathematical and statistical methods used to analyze chemical data are described and explained using a wide range of examples.

In addition, the Software program Minitab 15 (Free trial) is available for the participants in the course for statistical training. Examination will be conducted at the end of the course.

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

COURSE OBJECTIVES

1. To understand how the analysis of data derives from the statement of an analysis problem or hypothesis and the availability of experiential data.
2. To understand how to conduct a variety of statistical analyses, including testing of statistical assumptions, data transformations, and validation of statistical findings.
3. Ability to design a data analysis strategy that answers a research or routine work question, including specifications for data elements, requirements of the statistic, and limitations to the interpretation.
4. To understand how to present and interpret the results of statistical analyses.
5. To calculate measurement uncertainty in a practical and pragmatic manner.
6. To identify sources of measurement error.
7. To use different methods to evaluate measurement uncertainty.
8. To run statistics comparison between two or three analyses methods.
9. How to use statistics software program.

WHO SHOULD ATTEND

- Chemists, analysts, lab technicians and whoever tasked to estimate the uncertainties of measurements in their respective laboratories.
- Engineers interested in acquiring an understanding of uncertainty measurements fundamentals and advance knowledge
- Lab manager, supervisor or middle laboratory personnel in the management, establishment of laboratory quality system or those involved in testing or calibration activities.

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. All presentations are made in excellent colorful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

COURSE OUTLINE

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

- INSTRUMENT ANALYSIS DATA
- PEAK EVALUATION
- INTERPOLATED GRAPH CALIBRATION USING EXTERNAL/ INTERNAL STANDARDS
- STANDARD ADDITION METHOD EXTRAPOLATED GRAPH
- ERRORS IN QUANTITATIVE ANALYSIS
- RANDOM AND SYSTEMATIC ERRORS IN TITRATION ANALYSIS
- STANDARD DEVIATION OF REPEATED MEASUREMENTS
- DISTRIBUTION OF ERRORS
- CONFIDENCE LIMIT OF THE MEAN OF REPLICATE MEASUREMENTS
- MEASUREMENT UNCERTAINTY
- ERRORS IN INSTRUMENTAL ANALYSIS REGRESSION AND CORRELATION
- USE OF REGRESSION LINES FOR COMPARING ANALYTICAL METHODS
- CONFIDENCE LIMIT FOR X-VALUE
- OUTLIERS IN REGRESSION
- LIMIT OF DETECTION
- SIGNIFICANCE TESTS FOR EVALUATION OF EXPERIMENTAL RESULTS
- (T-TEST) COMPARISON OF A MEAN WITH A KNOWN VALUE
- (T-TEST) COMPARISON OF THE MEANS OF TWO SAMPLES WITH S1≈S2
- (T-TEST) COMPARISON OF THE MEANS OF TWO SAMPLES WITH S1 ≠ S2
- PAIRED T-TEST
- ONE-TAILED AND TWO-TAILED TESTS
- (F-TEST) FOR THE COMPARISON OF STANDARD DEVIATIONS
- ANOVA-TEST ANALYSIS OF SEVERAL MEANS AND VARIANCES
- TESTING FOR NORMALITY OF DISTRIBUTION
- OUTLIERS TEST
- NON-PARAMETRIC OR DISTRIBUTION-FREE METHODS
- BOX AND WHISKER PLOTS
- COMPARISON OF A MEDIAN WITH A KNOWN VALUE (THE SIGN TEST)
- CONFIDENCE INTERVAL FOR NON-PARAMETRIC METHODS
- COMPARISON OF THE MEDIANS OF TWO METHODS (THE SIGN TEST)
- COMPARISON MEDIAN OF TWO UNDEPENDED SAMPLES (WILCOXON RANK-SUM TEST)
- COMPARISON SPREAD OF TWO SETS OF NON-PARAMETRIC RESULTS (SIEGEL-TUKEY TEST)
- RANK CORRELATION FOR NOT QUANTIFIED RESULTS (SPEARMAN METHOD)
- NON-PARAMETRIC METHOD ON MORE THAN TWO SAMPLES (FRIEDMAN´S TEST)
- NON-PARAMETRIC REGRESSION METHODS (THEIL´S TEST) QUALITY CONTROL CHARTS

P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com

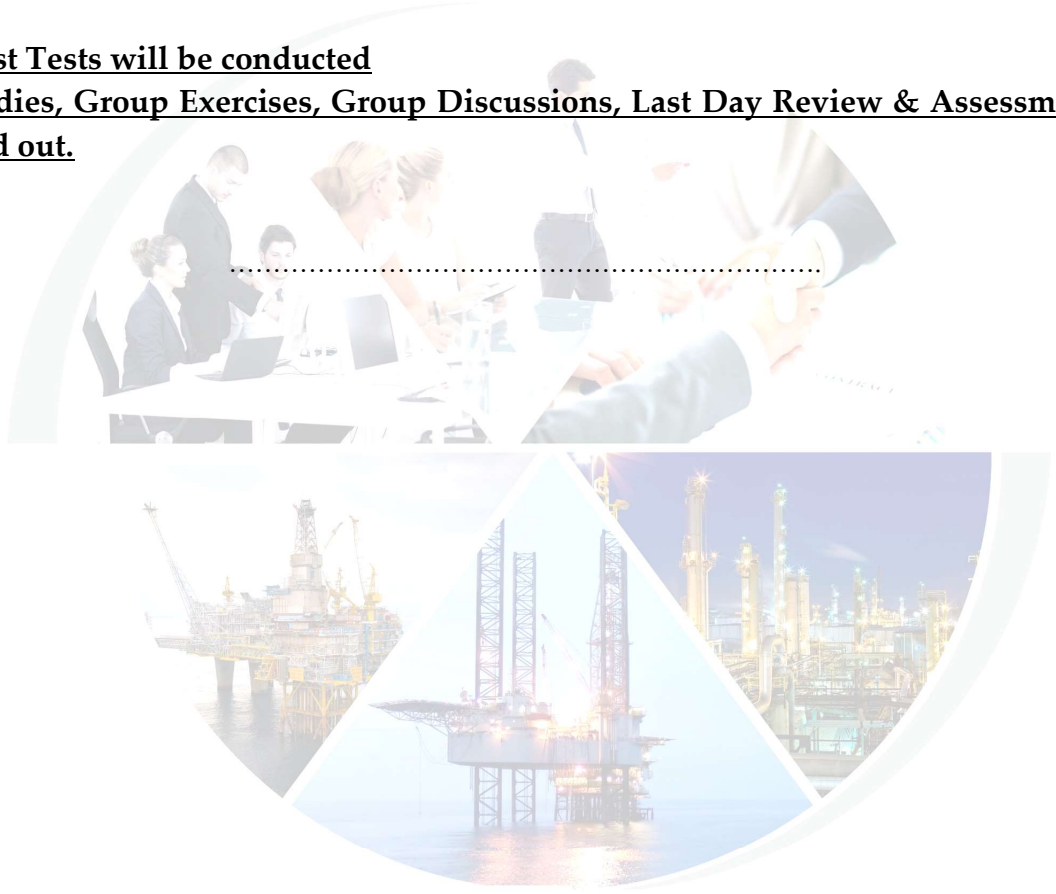
- QUALITY CONTROL CHARTS
- SHEWHART CHART
- CUSUM CHART
- EXPERIMENTAL DESIGN AND OPTIMIZATION METHODS
- FACTORIAL DESIGNS
- ESTIMATION OF FACTORS INTERACTION BY TWO-WAY ANOVA TEST
- OPTIMIZATION METHOD
- THREE FACTORS DESIGN

NOTE:

Pre & Post Tests will be conducted

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

.....



P.O BOX 45304
ABU DHABI, U.A.E
T +971 2 6264455
F +971 2 6275344
www.definetraining.com