



Analysis of Multi-Variable Data Sets

Course Overview

High technology product development and manufacturing often produce data sets containing large numbers of variables. This is true also of many transactional business processes. This course focuses on statistical and graphical methods specifically designed for analyzing multi-variable data sets. Participants will learn the concepts underlying these methods, and learn how to apply them using a leading statistical software package.

Course Content

Day 1

A. Introduction

Review of basic statistics, hypothesis testing, simple regression, Analysis of Variance (ANOVA), standard assumptions underlying statistical analysis, how to handle violations of standard assumptions.

B. Analysis with Multiple Categorical Factors

Multi-factor ANOVA; main effects, interactive effects, hypothesis testing, model building; residuals and predicted values; interpretive and diagnostic plots.

C. Analysis with Random Factors

Using ANOVA to test and quantify components of variation in measurement and production processes; fixed, random, and quantitative factors; crossed, nested, and mixed designs; interpretive and diagnostic plots.

Day 2

D. Analysis with Multiple Quantitative Factors

Multiple regression; main effects, interactive effects, hypothesis testing; polynomial regression; model building; residuals and predicted values; interpretive and diagnostic plots; the problem of co-linearity and what to do about it.

E. Analysis with both Quantitative and Categorical Factors

The general linear model; use of indicator variables: Analysis of Covariance; main effects, interactive effects, hypothesis testing; residuals and predicted values; interpretive and diagnostic plots.

F. Analysis with a Categorical Response Variable

Binary logistic regression; ordinal logistic regression.

How You Will Benefit

By the end of the course, you will be able to:

- Explain the basic concepts and methods of ANOVA and regression analysis.



- Choose appropriate statistical methods to analyze multi-variable data sets in their areas of application.
- Correctly conduct multi-variable analyses using Minitab statistical software.
- Correctly interpret the results of multi-variable statistical analyses.

Who Should Attend

Managers (R&D, account, product, manufacturing, quality); engineers and technicians (R&D, process, product, manufacturing, quality); Marketing, Sales, Planning.

Prerequisites

Participants in this training course should have a windows based laptop computer loaded with Minitab 16 software and be proficient in the use of Windows based computers and Microsoft Excel is assumed. Prior completion of the ETI Group *Practical Data Analysis* course or equivalent is highly recommended.

Course Duration

This program will take 16-hours to complete.

Course Materials

Each participant will receive a workbook containing all required course material and a file folder containing electronic copies of the data sets used in the course.

Training Program Fees

ETI Group can present this training program at your facility. Your cost, including all workshop materials and workbooks for up to twelve participants is \$4,500. Please note that this training program and materials can be “tailored” to meet any requirements unique to your company.