

## Regression Analysis and Model Building

This course will provide an in-depth understanding of regression technique which is used to investigate the relationship between two or more variables. The first part of the course deals with the fundamentals of regression analysis. In the next part, complete instructions will be provided to build, run, and interpret the regression models using MINITAB computer software. The course will provide a complete analysis on how to interpret the regression equation, the meaning and interpretation of the terms including the coefficient of multiple determination, the standard error of the estimate, and the problems and limitations of regression method. It will also provide the details on how to test the overall significance of regression, hypothesis testing on individual regression coefficients, confidence and prediction intervals in regression analysis, residual analysis and model adequacy checking, and the detection of outliers.

The model building part of the course will examine the first order, the second-order (quadratic), third and higher order models. It will provide computer instructions on building quadratic models and interpretation of such models, models with two quantitative independent variables  $x_1$  and  $x_2$ , interaction models, a complete second-order model with two quantitative variables, models with one qualitative independent variable, and a model with one quantitative and a qualitative variable at different levels. The procedure for finding the best possible prediction equation using regression, all subset regression, and the step-wise regression will also be discussed. The computer instructions for building the data file, and running these models along with their interpretation will be provided.