Statistical Decision-powering Analytics for Engineering & R&D

The LIFE-BLOOD for Engineers and Researchers
engaged in Quality, Manufacturing, Electronic, Medical and Life science R&D

Whatever cannot be measured cannot be improved !

Data is the life-blood of researchers engaged in research work; of engineers engaged in production … The massive and meticulous efforts that go into scientific studies in research and production will go to waste unless the voluminous masses of data that these activities churn out are correctly analyzed and interpreted.

We are NOT short of data in the workplace! In fact, we are overwhelmed, bombed out, immersed over, flooded with barrages of data we don't know what to do with! What we ARE short of is the means to make business sense of these mountains of numbers and figures! Our institutions of learning tried to imbue us with some statistical know-how … But, we are quick to give them back to our lecturers!

Quality, Manufacturing and R&D engineers must equip themselves with the rudiments of statistical analysis, so as to improve their capability to analyze and interpret the multifarious and profusion of data they are overwhelmed with in their jobs every day … Statistical savviness and competence is a quintessential skill for all Engineering and R&D professionals.

This new-found statistical savviness will positively empower engineers to execute and deliver with more confidence and authority by enhancing the effectiveness and accuracy of their decisions, which is absolutely critical for the success and competitiveness of their organizations.

What you will learn:

- ✓ Statistics 101
- ✓ A Performance Indicator to measure how well customer specifications are met
- ✓ Nature of data and implications on their statistical treatment and analyses
- ✓ Statistical methods for decision-making
- ✓ Understanding the assumptions behind each statistical technique
- ✓ Choosing the correct statistical tool / technique for each application
- ✓ Use of the 2 best software packages for statistical analysis work

Course Content

* Data, info, Statistics & Decision-making
* Histograms
* Mean and standard deviation
* Populations and samples
* Normal distributions
* The Standard z-distribution
* Estimating %tage out-of-spec
* Central Limit Theorem – The Statistician's Ohm's Law
* Nature of data - implications on data analysis
* Confidence intervals
* Measuring how well we meet customer specifications
* Comparative & Improvement Analyses
  - ✓ Hypothesis testing
  - ✓ Concept and application of statistical significance
  - ✓ t-tests : Independent & paired
  - ✓ Test for equality of variances
  - ✓ Independent t-test for case of unequal variances
  - ✓ ANOVA
  - ✓ Chi-square tests
* Understanding inter-dependence, correlation and causation
* Regression analysis
* Real-life case studies

Course Duration: 3 days

Training Methodology: Lectures & tutorials, team discussions, quizzes, case studies

Who should attend:

- ✓ R&D engineers
- ✓ Process engineers
- ✓ SPC practitioners
- ✓ Equipment engineers
- ✓ Production / Manufacturing engineers
- ✓ Test / Product engineers
- ✓ Quality engineers
- ✓ Supplier Quality engineers

Pre-requisites:

Degree or Diploma in a science / technical discipline

What ex-participants say they like about this course:

- ✓ Fun lectures
- ✓ Working in a group and lunch together
- ✓ The way the instructor conducts the class
- ✓ The relevance to future project undertakings
- ✓ The presentations and group discussions
- ✓ Reading material is not too wordy
- ✓ The instructor and the training materials
- ✓ The materials are very useful and applicable to our research work
- ✓ Emphasis on concepts behind tests
- ✓ Clear explanation for each topic
- ✓ Detailed explanation on how the formulae come about
- ✓ Instructor is able to explain the concepts behind the theory very well
- ✓ Tutorials & quizzes to strengthen the understanding
- ✓ The interaction between the instructor & participants
- ✓ Interactions between trainer and participants, instead of one-way teaching
- ✓ Detailed explanation by the instructor
- ✓ The way the instructor conduct the class
- ✓ Good examples throughout the course
- ✓ Real life examples and discussions
- ✓ The real life examples and detailed explanation
- ✓ I like it when the lecturer applied the concepts in every exercise; help me better understand each concept.
- ✓ Theory and practical together, helpful in understanding
- ✓ Many case and scenarios were studied and discussed in depth
- ✓ Emphasis on basics, which is very important as we are losing the knowledge about the concepts behind the statistical tests because of the convenience of statistical software
- ✓ I manage to refresh back my statistics and data analysis knowledge from previous studies! Plus, I learn a lot of statistic techniques & terminology and also the software used!
- ✓ Trainer's enthusiasm and supportive + encouraging attitude teaching & students' learning.
- ✓ The trainer provide friendly environment & make us feel comfortable with statistics
- ✓ The illustration & delivery of the trainer can be well understood by her friendly teaching
- ✓ The instructor really knows how to make us interested in this course, she's so friendly and knowledgeable.