

Course ID
INDSTAT
Course Duration
2 days

Course Title
Industrial Statistics: A Tutorial

Related Courses

- Design of Experiments: An Overview (DOE1, 1 day)
- Design of Experiments: A Comprehensive Course and Workshop (DOE2, 2 -3 days)
- Systems Engineering: An Intermediate Tutorial and Workshop (SYSENG, 2 days)
- Thinking Out of the Box: A Systems Engineering Imperative (OUTOFBOX, 2 days)
- Root Cause Analysis of Systems Failure: A Comprehensive Five Day Workshop (RCFA, 5 days)
- Root Cause Analysis of Systems Failure: A Tutorial (RCFA2D, 2 days)
- Root Cause Analysis of Systems Failure: A Comprehensive Course (RCFA4D, 4days)
- Root Cause Analysis of Component Failure: Understanding Human and Engineering Factors for Improved Product Performance (RCFA-ME, 2-4 days)

Aimed At

This course is aimed at design, engineering, quality assurance, and manufacturing personnel involved in product and process design and development.

Prerequisites

While there are no formal prerequisites, the course assumes a process, industrial, manufacturing, or engineering background.

Group Size

5-25

Course in a Nutshell

This course brings together important concepts that allow engineering and operations organizations to understand industrial statistics concepts. The focus is on applying these concepts to optimize processes, implement statistical process control, and use statistical concepts in assessing product and process performance. The course utilizes real-life case studies to help you understand these technologies. At the end of the course, you will have an understanding of the key industrial statistics tools, technologies, terminology, and capabilities.

Learn How To

- Work together in an effective team environment to implement industrial statistical concepts.
- Use the technologies presented in this course to identify key product design and manufacturing process tolerances and control limits.
- Reduce or eliminate areas of specification non-compliance.
- Proactively design test and inspection approaches that are consistent with product and process capabilities.

Course Outline

Day 1

- Basic Probability and Statistics
 - Deterministic versus probabilistic thinking
 - The normal curve: Its history and mathematics
 - The nature of variability
 - Means and standard deviations
 - Using normal curves, means, and standard deviations to predict probabilities of occurrence
 - Confidence levels
- Minimizing Variability
 - Product and process design
 - Identifying sources of variability
 - Identifying potential key performance parameters
 - The concept of a capable process
 - Approaches for minimizing variability
- Basic Statistics Test Approaches
 - The z-test
 - The t-test
 - Analysis of variance (ANOVA)
 - Fractional factorial experiments and Taguchi testing
 - Case studies

Day 2

- Detection versus Prevention Process and Design Approaches
 - Detection-oriented systems
 - Prevention-oriented systems
 - Collecting and using nonconformance data
- Test and Inspection
 - The nature of inspection
 - Sampling plans
 - Inspection shortfalls
 - The fallacy of redundant inspection
 - Statistical process control
 - Statistical process control implementation
 - Development, qualification, and acceptance testing
 - Probabilities of passing receiving, in-process, and final acceptance testing
 - Operating characteristic curves
- Applications
 - Product nonconformance considerations
 - Improving processes with statistical tools
 - Using Excel's built in statistical analysis features
 - Case studies
- Course Wrap-up: Recap, Q/A, and Evaluations

**How You Will
Learn**

- A highly experienced consulting engineer-instructor will present this course in an interactive lecture format.
- Along with the lecture, we use exercises, puzzles, case studies, and interesting group activities to enrich the instruction and drive home the essential points.
- You will receive a Participant Handbook that includes all materials presented in class, which will help you remember and retain what you learned and apply it on your job.
- You will learn key industrial statistics concepts from both theoretical and practical perspectives.