

Program Outline



Experimental Practices

Run Time (h:mm:ss)

Global Concepts

11:07:36

Training Orientation

1:29:43

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| Excel Orientation | <i>Explore the Excel software package</i> | 0:29:01 |
| Minitab Orientation | <i>Explore the Minitab software package</i> | 0:31:42 |
| Simulator Orientation | <i>Explore the Process Simulator</i> | 0:29:00 |

Breakthrough Vision

1:31:26

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| Deterministic Reasoning | <i>Describe a basic cause-and-effect relationship in terms of $Y=f(X)$</i> | 0:52:57 |
| Leverage Principle | <i>Relate the principle of leverage to an improvement project</i> | 0:38:29 |

Process Management

8:06:27

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| Performance Yield | <i>Explain why final yield is often higher than first-time yield</i> | 1:14:06 |
| Hidden Processes | <i>Describe the non-value added component of a process</i> | 0:40:57 |
| Measurement Power | <i>Describe the role of measurement in an improvement initiative</i> | 0:33:38 |
| Establishing Baselines | <i>Explain why performance baselines are essential to realizing improvement</i> | 0:45:52 |
| Defect Opportunity | <i>Understand the nature of a defect opportunity and its role in metrics reporting</i> | 1:01:18 |
| Process Models | <i>Define the key features of a Six Sigma performance model</i> | 1:11:11 |
| Process Capability | <i>Identify the primary indices of process capability</i> | 1:21:53 |
| Design Complexity | <i>Describe the impact of complexity on product and service quality</i> | 1:17:32 |

General Practices

17:36:29

Quality Tools

8:30:56

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| Variable Classifications | <i>Define the various types of variables commonly encountered during quality improvement</i> | 0:08:32 |
| Measurement Scales | <i>Describe each of the four primary scales of measure and their relative power</i> | 0:50:01 |
| Problem Definition | <i>Characterize the nature of a sound problem statement</i> | 0:35:25 |
| Focused Brainstorming | <i>Explain how focused brainstorming is used to facilitate improvement efforts</i> | 0:11:57 |
| Matrix Analysis | <i>Understand how matrices are created and used to facilitate problem solving</i> | 0:16:56 |
| C&E Analysis | <i>Explain how C&E matrices can be used to solve quality problems</i> | 0:06:02 |
| Performance Sampling | <i>Explain how to design and implement a sampling plan</i> | 0:20:17 |
| Check Sheets | <i>Understand how check sheets can be used for purposes of data collection</i> | 0:12:59 |
| Analytical Charts | <i>Identify the general range of analytical charts that can be used to assess performance</i> | 0:20:02 |
| Pareto Charts | <i>Explain how Pareto charts can be used to isolate improvement leverage</i> | 0:24:25 |
| Run Charts | <i>Utilize run charts to assess and characterize time-based process data</i> | 0:10:59 |
| Correlation Charts | <i>Utilize a correlation chart to illustrate the association between two variables</i> | 1:01:24 |
| Frequency Tables | <i>Explain how to construct and interpret a frequency table</i> | 0:14:42 |
| Performance Histograms | <i>Construct and interpret a histogram and describe several purposes</i> | 1:14:40 |

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| Basic Probability | <i>Understand basic probability theory and how it relates to process improvement</i> | 0:29:16 |
| Search Patterns | <i>Explain how the use of designed experiments can facilitate problem solving</i> | 0:32:13 |
| Concept Integration | <i>Understand how to sequence a given selection of quality tools to better solve problems</i> | 1:02:54 |
| Quality Simulation | <i>Employ the related quality tools to analyze data generated by the process simulator</i> | 0:18:12 |

Basic Statistics

9:05:33

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| Performance Variables | <i>Identify and describe the types of variables typically encountered in field work</i> | 0:10:26 |
| Statistical Notation | <i>Recognize and interpret the conventional forms of statistical notation</i> | 0:44:53 |
| Performance Variation | <i>Explain the basic nature of variation and how it can adversely impact quality</i> | 0:22:24 |
| Normal Distribution | <i>Describe the features and properties that are characteristic of a normal distribution</i> | 0:49:36 |
| Distribution Analysis | <i>Explain how to test the assumption that a set of data is normally distributed</i> | 1:21:06 |
| Location Indices | <i>Identify, compute, and interpret the mean, median, and mode</i> | 0:42:05 |
| Dispersion Indices | <i>Identify, compute, and interpret the range, variance, and standard deviation</i> | 1:16:37 |
| Quadratic Deviations | <i>Understand the nature of a quadratic deviation and its basic purpose</i> | 0:24:47 |
| Variation Coefficient | <i>Compute and interpret the coefficient of variation</i> | 0:07:17 |
| Deviation Freedom | <i>Explain the concept of degrees-of-freedom and how it is used in statistical work</i> | 0:29:47 |
| Standard Transform | <i>Describe how to transform a set of raw data into standard normal deviates</i> | 0:47:51 |
| Standard Z-Probability | <i>Describe how to convert a standard normal deviate into its corresponding probability</i> | 0:40:58 |
| Central Limit | <i>Understand that the distribution of sampling averages follows a normal distribution</i> | 0:17:29 |
| Standard Error | <i>Recognize that the dispersion of sampling averages is described by the standard error</i> | 0:13:32 |
| Student's Distribution | <i>Understand that the T distribution applies when sampling is less than infinite</i> | 0:06:07 |
| Standard T-Probability | <i>Describe how to convert a T value into its corresponding probability</i> | 0:15:26 |
| Statistics Simulation | <i>Employ basic statistics to analyze data generated by the process simulator</i> | 0:15:12 |

Technical Practices

28:58:34

Hypothesis Testing

6:05:49

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| Statistical Inferences | <i>Explain the concept of a statistical inference and its primary benefits</i> | 0:23:00 |
| Statistical Questions | <i>Explain the nature and purpose of a statistical question</i> | 0:20:35 |
| Statistical Problems | <i>Understand why practical problems must be translated into statistical problems</i> | 0:10:43 |
| Null Hypotheses | <i>Define the nature and role of null hypotheses when making process improvements</i> | 0:31:29 |
| Alternate Hypotheses | <i>Define the nature and role of alternate hypotheses when making process improvements</i> | 0:18:03 |
| Statistical Significance | <i>Explain the concept of statistical significance versus practical significance</i> | 0:56:05 |
| Alpha Risk | <i>Explain the concept of alpha risk in terms of the alternate hypothesis</i> | 0:24:18 |
| Beta Risk | <i>Define the meaning of beta risk and how it relates to test sensitivity</i> | 0:38:41 |
| Criterion Differences | <i>Explain the role of a criterion difference when testing hypotheses</i> | 0:15:49 |
| Decision Scenarios | <i>Develop a scenario that exemplifies the use of hypothesis testing</i> | 0:17:09 |
| Sample Size | <i>Define the statistical elements that must be considered when computing sample size</i> | 1:49:57 |

Confidence Intervals

2:47:17

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| Mean Distribution | <i>Comprehend and characterize the distribution of sampling averages</i> | 0:04:21 |
| Mean Interval | <i>Compute and interpret the confidence interval of a mean</i> | 0:54:29 |
| Variance Distribution | <i>Comprehend and characterize the distribution of sampling variances</i> | 0:21:10 |
| Variance Interval | <i>Compute and interpret the confidence interval of a variance</i> | 0:35:52 |
| Proportion Distribution | <i>Comprehend and characterize the distribution of sampling proportions</i> | 0:07:22 |
| Proportion Interval | <i>Compute and interpret the confidence interval of a proportion</i> | 0:27:02 |
| Frequency Interval | <i>Describe how frequency of defects is related to confidence intervals</i> | 0:17:01 |

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| Parametric Methods | | 8:19:55 |
| Mean Differences | <i>Determine if two means are statistically different from each other</i> | 1:37:53 |
| Variance Differences | <i>Determine if two variances are statistically different from each other</i> | 0:39:34 |
| Variation Total | <i>Compute and interpret the total sums-of-squares</i> | 0:16:36 |
| Variation Within | <i>Compute and interpret the within-group sums-of-squares</i> | 0:10:53 |
| Variation Between | <i>Compute and interpret the between-group sums-of-squares</i> | 0:11:47 |
| Variation Analysis | <i>Explain how the analysis of variances can reveal mean differences</i> | 0:32:21 |
| One-Way ANOVA | <i>Construct and interpret a one-way analysis-of-variance table</i> | 1:16:36 |
| Two-Way ANOVA | <i>Construct and interpret a two-way analysis-of-variance table</i> | 0:20:05 |
| N-Way ANOVA | <i>Construct and interpret an N-way analysis-of-variance table</i> | 0:12:49 |
| ANOVA Graphs | <i>Construct and interpret a main effects plot as well as an interaction plot</i> | 0:37:24 |
| Linear Regression | <i>Conduct a linear regression and construct an appropriate model</i> | 1:17:34 |
| Multiple Regression | <i>Conduct a multiple regression and construct an appropriate model</i> | 0:15:59 |
| Residual Analysis | <i>Compute and analyze the residuals resulting from a simple regression</i> | 0:18:46 |
| Parametric Simulation | <i>Apply general regression methods to the process simulator</i> | 0:31:38 |
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| Experimental Methods | | 10:29:49 |
| Design Principles | <i>Understand the principles of experiment design and analysis</i> | 0:43:05 |
| Design Models | <i>Describe the various types of designed experiments and their applications</i> | 0:13:18 |
| Experimental Strategies | <i>Outline a strategy for designing and analyzing a statistical experiment</i> | 0:21:14 |
| Experimental Effects | <i>Define the various types of experimental effects and how they impact decisions</i> | 0:24:26 |
| One-Factor Two Level | <i>Configure and analyze a one-factor two-level statistically based experiment</i> | 0:38:35 |
| One-Factor Multi Level | <i>Configure and analyze a one-factor multi-level statistically based experiment</i> | 0:11:09 |
| Full Factorials | <i>Understand the nature and underlying logic of full factorial experiments</i> | 0:19:46 |
| Two-Factor Two Levels | <i>Configure and analyze a two-factor two-level statistically based experiment</i> | 2:13:26 |
| Two-Factor Multi Level | <i>Configure and analyze a two-factor multi-level statistically based experiment</i> | 0:04:29 |
| Three-Factor Two Level | <i>Configure and analyze a three-factor two-level statistically based experiment</i> | 0:51:20 |
| Planning Experiments | <i>Understand the planning and implementation considerations related to statistical experiments</i> | 0:29:17 |
| Fractional Factorials | <i>Understand the nature and underlying logic of fractional factorial experiments</i> | 1:16:46 |
| Four-Factor Half-Fraction | <i>Configure and analyze a four-factor half-fraction statistically based experiment</i> | 0:15:46 |
| Five-Factor Half-Fraction | <i>Configure and analyze a five-factor half-fraction statistically based experiment</i> | 0:30:29 |
| Screening Designs | <i>Understand how to select, implement, and analyze a screening experiment</i> | 0:16:28 |
| Robust Designs | <i>Explain the purpose of robust design and define several practical usages</i> | 1:12:35 |
| Experiment Simulation | <i>Describe how a DOE can be employed when measurement data is not available</i> | 0:27:40 |
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| Measurement Analysis | | 1:15:44 |
| Measurement Uncertainty | <i>Understand the concept of measurement uncertainty</i> | 0:15:43 |
| Measurement Components | <i>Describe the components of measurement error and their consequential impact</i> | 0:15:42 |
| Measurement Studies | <i>Explain how a measurement systems analysis is designed and conducted</i> | 0:44:19 |

Total Video Run Time 57:42:39