Program Outline

Diagnostic Practices

Run Time (h:mm:ss)

Global Concepts   11:07:36

Training Orientation   1:29:43

Excel Orientation	*Explore the Excel software package*	0:29:01
Minitab Orientation	*Explore the Minitab software package*	0:31:42
Simulator Orientation	*Explore the Process Simulator*	0:29:00

Breakthrough Vision   1:31:26

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

Process Management   8:06:27

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

General Practices   22:18:51

Quality Tools   13:13:18

Variable Classifications	*Define the various types of variables commonly encountered during quality improvement*	0:08:32
Measurement Scales	*Describe each of the four primary scales of measure and their relative power*	0:50:01
Problem Definition	*Characterize the nature of a sound problem statement*	0:35:25
Focused Brainstorming	*Explain how focused brainstorming is used to facilitate improvement efforts*	0:11:57
Process Mapping	*Understand how to define the flow of a process and map its operations*	0:24:20
SIPOC Diagram	*Describe the nature and purpose of an SIPOC diagram*	0:08:26
Force-Field Analysis	*Utilize force field analysis to solve problems*	0:14:49
Matrix Analysis	*Understand how matrices are created and used to facilitate problem solving*	0:16:56
C&E Analysis	*Explain how C&E matrices can be used to solve quality problems*	0:06:02
Failure Mode Analysis	*Understand how FMEA is used to realize process and design improvements*	0:11:18
Performance Sampling	*Explain how to design and implement a sampling plan*	0:20:17
Check Sheets	*Understand how check sheets can be used for purposes of data collection*	0:12:59

Analytical Charts	*Identify the general range of analytical charts that can be used to assess performance*	0:20:02
Pareto Charts	*Explain how Pareto charts can be used to isolate improvement leverage*	0:24:25
Run Charts	*Utilize run charts to assess and characterize time-based process data*	0:10:59
Multi-Vari Charts	*Define the major families of variation and how they can be graphed*	0:49:29
Correlation Charts	*Utilize a correlation chart to illustrate the association between two variables*	1:01:24
Frequency Tables	*Explain how to construct and interpret a frequency table*	0:14:42
Performance Histograms	*Construct and interpret a histogram and describe several purposes*	1:14:40
Basic Probability	*Understand basic probability theory and how it relates to process improvement*	0:29:16
Pre-Control Charts	*Describe the fundamental rules that guide the operation of a standard pre-control plan*	0:41:25
Control Charts	*Explain the purpose of statistical process control charts and the logic of their operation*	1:41:11
Score Cards	*Understand the purpose of Six Sigma score cards and how they are deployed*	0:31:24
Search Patterns	*Explain how the use of designed experiments can facilitate problem solving*	0:32:13
Concept Integration	*Understand how to sequence a given selection of quality tools to better solve problems*	1:02:54
Quality Simulation	*Employ the related quality tools to analyze data generated by the process simulator*	0:18:12

Basic Statistics   **9:05:33**

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

Technical Practices   **25:49:13**

Hypothesis Testing   **6:05:49**

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

Confidence Intervals		**2:47:17**
Mean Distribution	*Comprehend and characterize the distribution of sampling averages*	0:04:21
Mean Interval	*Compute and interpret the confidence interval of a mean*	0:54:29
Variance Distribution	*Comprehend and characterize the distribution of sampling variances*	0:21:10
Variance Interval	*Compute and interpret the confidence interval of a variance*	0:35:52
Proportion Distribution	*Comprehend and characterize the distribution of sampling proportions*	0:07:22
Proportion Interval	*Compute and interpret the confidence interval of a proportion*	0:27:02
Frequency Interval	*Describe how frequency of defects is related to confidence intervals*	0:17:01

Parametric Methods		**8:19:55**
Mean Differences	*Determine if two means are statistically different from each other*	1:37:53
Variance Differences	*Determine if two variances are statistically different from each other*	0:39:34
Variation Total	*Compute and interpret the total sums-of-squares*	0:16:36
Variation Within	*Compute and interpret the within-group sums-of-squares*	0:10:53
Variation Between	*Compute and interpret the between-group sums-of-squares*	0:11:47
Variation Analysis	*Explain how the analysis of variances can reveal mean differences*	0:32:21
One-Way ANOVA	*Construct and interpret a one-way analysis-of-variance table*	1:16:36
Two-Way ANOVA	*Construct and interpret a two-way analysis-of-variance table*	0:20:05
N-Way ANOVA	*Construct and interpret an N-way analysis-of-variance table*	0:12:49
ANOVA Graphs	*Construct and interpret a main effects plot as well as an interaction plot*	0:37:24
Linear Regression	*Conduct a linear regression and construct an appropriate model*	1:17:34
Multiple Regression	*Conduct a multiple regression and construct an appropriate model*	0:15:59
Residual Analysis	*Compute and analyze the residuals resulting from a simple regression*	0:18:46
Parametric Simulation	*Apply general regression methods to the process simulator*	0:31:38

Chi-Square Methods		**3:18:48**
Statistical Definition	*Describe how to translate a practical problem into a statistical problem*	0:31:53
Model Fitting	*Explain what is meant by the term "Model Fitting" and discuss its practical role in Six Sigma work*	0:58:32
Testing Independence	*Explain how a test of independence can be related to the idea of correlation*	1:01:00
Contingency Coefficients	*Understand how a contingency coefficient relates to a cross-tabulation table*	0:12:53
Yates Correction	*Describe the role of Yates correction in terms of the chi-square statistic*	0:07:17
Testing Proportions	*Test the significance of two proportions using the Chi-square statistic*	0:27:13

Survey Methods		**2:41:53**
Research Design	*Explain how the idea of research design fit with the idea of problem Solving*	0:12:54
Information Sources	*Explain how the idea of research design fit with the idea of problem Solving*	0:09:34
Questionnaire Construction	*Describe the role of survey demographics when analyzing closed-form survey data*	0:19:24
Formulating Questions	*Identify several things that should be avoided when developing survey questions*	0:15:22
Question Quality	*Explain what is meant by the term "question quality" and how this idea relates to data analysis*	0:07:06
Sampling Plans	*Describe several different types of sampling plans commonly used in survey research*	0:07:14
Data Analysis	*Explain how categorical survey data can be analyzed to establish strength of association*	1:30:19

Nonparametric Methods		**1:19:47**
Nonparametric Concepts	*Explain the difference between parametric and nonparametric methods*	0:06:59
Median Test	*Execute a median test on two groups and then determine if the difference is statistically significant*	0:48:55
Runs Test	*Conduct a runs test to determine if a time series pattern is random*	0:08:07
Other Tests	*Identify two nonparametric methods other than a median or runs test*	0:15:46

Measurement Analysis   **1:15:44**

    Measurement Uncertainty   *Understand the concept of measurement uncertainty*   0:15:43

    Measurement Components   *Describe the components of measurement error and their consequential impact*   0:15:42

    Measurement Studies   *Explain how a measurement systems analysis is designed and conducted*   0:44:19

Total Video Run Time   **59:15:40**