

EXCELLENCE THROUGH ANALYTICS: BEYOND SIX SIGMA

Data Acquisition Strategies: Six Sigma and Beyond I & II

- **Location:** Knoxville, Tennessee
- **Duration:** Two Non-Consecutive Weeks
- **2012 Dates:** April 1-6 and April 30-May 4
- **Tuition:** \$7,500 (includes materials, meals, and lodging)
- Program fees are subject to change. Visit our website (<http://TheCenter.utk.edu>) for the latest information.
- Class size is limited

Participant Profile

Data Acquisition Strategies: Six Sigma and Beyond I & II targets managers, engineers, area managers, and project leaders involved in using proactively acquired data to improve process performance.

The course is specifically designed to create organizational leaders who can sustain improvement initiatives within the organization.

Hence, individuals who will be successful using the skills taught in this course are informal leaders who are respected by their colleagues for their experience, expertise and process/product knowledge.

The in-class discussions are intended to support an in-depth understanding of the concepts and methods. *Data Acquisition Strategies: Six Sigma and Beyond I & II* will take those who already have a base knowledge of the tools and develop them to become invaluable mentors and leaders to support on-going organizational initiatives.

Course Overview

Data Acquisition Strategies: Six Sigma and Beyond I & II goes beyond the teaching of a pre-defined roadmap and a checklist of tools. The faculty that developed the course have over 18 years of training and implementing six sigma and lean across many different industries. It is designed to take the sharpest individuals from an organization, utilize their knowledge and technical expertise, and train them in statistical thinking so

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that they can be leaders of improvement efforts within the organization.

The primary objective of this two-week course is to equip individuals with the skills to effectively acquire, interpret, and act on information from a process or product. The course does not focus on the analysis of a given set of data; rather it focuses on how to efficiently and effectively acquire the data to learn the most from the process. While the course does cover the basic concepts of six sigma, it goes beyond DMAIC and statistical tools. It teaches individuals:

- How to design proactive sampling plans so that the amount of information in a set of data is increased without requiring large amounts of data
- Critical questioning to guide data acquisition and interpretation of results
- DOE planning—type and size of design, factor selection, level setting, etc.
- How to effectively acquire data in order to gain specific insights into direction for work
- How to appropriately choose between different methodologies based on the voice of the process to increase throughput, eliminate backlogs, and reduce costs (direct and indirect).

Key Objectives

Topics covered in this program include:

1. The philosophy of six sigma
2. Critical thinking and the role of questions
3. DMAIC and iterative problem-solving techniques
4. $Y=f(x)$ as a model for knowledge-building
5. Graphical methods for investigating the behavior in data
6. Control charting methods for investigating components of variance
7. Proactive design of sampling strategies to obtain direction for future work

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8. Measurement uncertainty and measurement system evaluation
9. Sources of data and types of data
10. The role of sampling and Design of Experiments in sequential knowledge building
11. Process mapping techniques that support the development of $Y=f(x)$

In order for the in-class sessions to directly apply to the processes of the attending organizations, individual projects are a key part of the program work. The two course weeks are designed to build applied knowledge through the discussion of the concepts used to develop specific project applications.

Course Content

A schedule of *Data Acquisition Strategies: Six Sigma and Beyond I & II*'s session titles that comprises this two non-consecutive weeks course is attached.

Faculty

- **Cheryl Hild** is a faculty member in the Department of Statistics, Operations, and Management Science. Prior to returning to the University of Tennessee, she served as a senior associate with Six Sigma Associates (SSA). Hild has over 16 years of experience leading organizational training in applied statistics, lean operations, and design of experiments. She also managed and worked many manufacturing, design, and administrative projects with managers and engineers at companies including Whirlpool, Allied Signal Aerospace, Bell Helicopter, PP&G, Cytec Engineered Materials, Pfizer Capsugel, and others.

Hild has authored numerous articles and is co-author of the book, *The Power of Statistical Thinking: Improving Manufacturing Processes*. She received her Ph.D. in Management Science and Industrial Statistics from the University of Tennessee.

- **Doug Sanders** brings to the center significant expertise as president of Six Sigma Associates. Over the past 15 years, he has guided the global transformational efforts of varying organizational processes in industrial and

commercial organizations worldwide. Sanders received his Ph.D. in management science in 1996 from the University of Tennessee. He has authored a number of publications for both practitioners and academics. His research efforts focus on improving transactional processes within business and governmental organizations. Sanders teaches in the Center's process improvement programs.

- **Charles M. Cwiek**, Distinguished Lecturer in the Department of Statistics, Operations, and Management Science at The University of Tennessee, Cwiek specializes in the areas of industrial statistics, quality control methods, and process management. Cwiek teaches Introductory Statistics and Statistical Process Control to undergraduate students. In April of 2000, The University of Tennessee's College of Business Administration awarded Cwiek the Allen H. Kealy Outstanding Teaching Award. For over 20 years, Cwiek has taught in various courses offered through UT's Center for Executive Education (CEE). In addition to his teaching responsibilities, he develops, produces, and manages the graphical content of teaching materials used in selected courses within CEE. Cwiek also serves as a consultant to industry in the area of statistical process control. He has worked primarily within the automotive components industry setting up measurement system evaluation studies. Cwiek received his BS and MS in Statistics from The University of Tennessee.

- **Allen Pannell** is an executive consultant, specializing in process innovation and re-design, leadership, six sigma, strategic planning, and process management.

Since 1982, Pannell has led numerous companies through their most difficult challenges. By helping them to achieve aggressive goals, these organizations became more profitable in a short timeframe and some experienced dramatic turnarounds.

Pannell received his Masters of Science in Statistics and Finance from the University of

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Tennessee. His prior experience includes work with Martin Marietta Energy Systems and 12 years with Tennessee Associates International, where he worked his way up from consultant to vice-president, serving as executive consultant and a member of its board of directors.

- **Tony Cooper** is an engineer (Rensselaer) and a statistician (University of Tennessee). This combination of skills and his experience in a multitude of industrial situations yields a unique insight into processes. Determining reliable improvement opportunities in processes requires disciplined, but well thought out, data acquisition. Cooper was a founder of Six Sigma Associates in 1994 and has mentored numerous process improvement projects. Cooper received a Ph.D. in Management Science from the University of Tennessee in 1996.

Facilities

Classes are held in the executive classrooms in UT's Center for Executive Education. These facilities are designed to promote group interaction in an

environment conducive to applied discussion, feedback, and the development of relational networks that frequently continue well beyond the on-campus experience.

Accommodations are single-occupancy rooms at nearby hotels. Transportation from the hotel to the Center and to dining is provided.

Contact

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WEEK 1

Monday	Tuesday	Wednesday	Thursday	Friday
Philosophy & Introduction	Variables Data and Individuals and Moving Range Charts	Evaluating Differences Using X-Bar and R Charts	Introduction to Nested Studies with Dot Frequency Diagrams	Characteristics of an Effective Measurement Process
An Analytical View of Variation the Special Cause/Common Cause Model	Disaggregation and Introduction to Subgrouping	X-bar and R Charts and Within/Between Sources of Variation	Components of Variance I – Analysis and Interpretation of Nested Studies	Measurement System Evaluation: Applied Exercise
The Special Cause/Common Cause Model – Assessing Process Stability	A Process View: Process Mapping Techniques	Applied Exercise: Paper Helicopters – Evaluating Variation in Flight Times	Components of Variance II – Design of Sampling Plan to Separate Sources of Variation	Review and Closing Discussions
Using Control Charts to Assess Process Stability	Process Mapping (continued)	An Applied Exercise: Paper Helicopters (continued) Flights	On the Role of Historical Data in Process Studies	
Project Exercises & Discussions	Project Exercises & Discussions	Project Exercises & Discussions	Project Exercises & Discussions	

WEEK 2

Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 Review – Definitions and Concepts	Designing Sampling Plans: Applied Exercises	Applied Exercise: The Penny Drop	The Role of Thought Maps in Scientific Learning & Process Improvement	Analytical vs. Enumerative Studies
A Review of Nested Studies	Analyzing Sampling Plans: Applied Exercises	Fundamentals of Regression	Sequential Knowledge-Building: A Case Study	Analytical vs. Enumerative Studies
Crossed Studies and Interactions	Correlation vs. Causation	Analytical Regression Analysis	Sequential Knowledge-Building: A Case Study	Closing Discussions
Components of Variance III – Investigating Crossed & Systematic Differences	Correlation Studies & Scatter Diagrams	Histograms and Process Capability	The Role of Design of Experiments in Understanding Causal Relationships	
Project Exercises & Discussions	Project Exercises & Discussions	Applied Exercise (continued)	Applied Exercise & Project Discussions	