The new Hands logo we have adopted more accurately reflects what is distinctive about The Center’s approach to executive education: collaboration, integration, creative teamwork and hands-on learning. Our new logo, and indeed this new newsletter, serves to announce some exciting additions and changes here at The Center.

- Four new executive degree programs added to our portfolio during the last five years
- Black Belt Certification Program (see Focal Point: Black Belt Mastery this issue)
- Eight public and twenty on-site private company Lean Enterprise Programs
- Lean Enterprise Forum (established in April 1999) a consortium of companies that share learning, have access to special materials, and support targeted research in the lean area
- A new customized, six-month implementation program focusing on lean results with multi-company work groups, custom on-site projects, and scheduled consultations by the College’s lean team
- A one-week Basics of Multifactor Experimentation Program to equip engineers, manufacturing managers and quality professionals with the tools, process and faculty on-site support for designing experiments
- Initiation of plans for new executive education facilities with a move-in date of 2003

Change from the inside out

When we stopped to catch our breath, we realized our own business “morph” had occurred because of our drive to anticipate and respond to our customers. In short, our scope, our outside image and our inside structure just didn’t match. Our “brand” needed a revamp. The Center for Executive Education is a new name that reflects who we are today. It shows that The Center now offers degrees — not just development courses.

We didn’t stop at the name change. We also made internal changes to the organization. Changes that, we believe, will help our business partners interact with us more efficiently.

(Center Morph cont.)
The new position of Assistant Dean for Executive Education reflects the College’s strategic priority on graduate professional education. In this position, my job is to help all of these programs learn from each other—especially about what our customers need. I’ll be up here on the seventh floor of the Stokely Management Center in the thick of the action with you and I’d love to hear from you about issues in your area of work.

Providing the best learning environment possible has always been an important objective of our staff. To that end, we have created a new position of Manager of Executive Education Services who will work with the registrars, front office and the logistics team to develop more efficient systems behind the scenes and better customer service out front.

If you are interested in one of our degree programs, you’ll be glad to know we’ve cut away the red tape—registration, payment, books, syllabuses, etc. are all provided for you by The Center (with none of the lines, delays and hassle you may remember from your undergraduate days).

Eye on the business landscape

With the flurry of activity, we did not forget what made us such a good value in corporate education. The Center’s earliest management courses made it a world leader in the area of executive education and that leadership continues today. Our mission then was to reach beyond the classroom to give companies a tangible return on investment in executive education.

That same mission continues today for our degree programs and in the areas of statistical methods for process improvement and lean enterprise systems design. Every Executive MBA degree program has built-in applied projects designed to bring immediate value to the sponsoring organization. Both the degree programs and The Center’s specialized executive development programs have been nationally-recognized for their innovative approaches to educating managers and their orientation toward applied practice and implementation support. In 1998, Princeton Review named our new Physician Executive MBA the best distance education graduate program in the country.

We must continue to look ahead and anticipate the learning needs and delivery systems that companies will ask for several years out. Like you, we must systematically scan the business landscape, question what we are doing today, and take the risks that are essential to stay ahead. You and the issues your company are facing are our most valuable source of insight. Tell us what you need—and let us show you how we can build it together.

"Both the degree programs and The Center's specialized executive development programs have been nationally-recognized for their innovative approaches.... In 1998, Princeton Review named our new Physician Executive MBA the best distance education graduate program in the country."

Why do industrial experiments fail? Is it primarily because of a poor design, or poor execution, or an inadequate analysis? Bert Gunter, a statistical consultant and colleague, responds with a resounding “No.” In Bert’s 1993 Technometrics discussion:

"The overwhelming contributor is failure to use statistical design of experiments methods at all. In second place, and not far behind, is poor planning. The primary statistical issues that preoccupy us, poor design and analysis, barely show up."

Our agreement with this assertion has led us to revise CEE’s training courses in the use of experiments.

A New One-Week Course

For twelve years, the Statistics Department faculty has offered the CEE’s three-week Design of Experiments Institute. This highly-regarded institute thoroughly covered designed experiments and their analysis.

However, we found it was becoming increasingly more difficult for engineers, manufacturing managers, and quality professionals to commit to three weeks of training. Since we believed so strongly in the value of industrial experiments, we knew a change had to happen. But what would make the greatest impact? Given our support of Gunter’s analysis, we decided only one avenue was open to us.

To develop a course that would result in the widespread use of well-planned industrial experiments.

With that objective in mind, we tackled the next problem. How to mesh this objective with real world constraints like busy schedules and demanding jobs. The result was a new, one-week course: Basics of Multifactor Experimentation. The length and content of this course will get more engineers, manufacturing managers, and quality professionals to add an additional tool to their repertoire—and get them involved in running experiments.
Making Tools Accessible

Obviously, we had to condense the learning material when we moved from three weeks to one week. To do this, we focused on Gunter’s first cause of failure: not using the methods at all. The solution was to emphasize the single most useful set of designs for industry — the two-level full factorial and fractional factorial designs. These experimental plans have been used to improve both product and process designs in virtually every manufacturing industry in the U.S. During the Basics of Multifactor Experimentation course, participants will learn to investigate the effects of three to seven factors in eight or sixteen experimental runs. Analyzing these experiments is very straightforward. The statistical designs and their analyses are not esoteric methodology for a few experts, nor a rigid cultic practice for automatons. Instead, they are accessible tools for virtually all engineers and others, which, once understood, can be used intelligently by any one with product/process responsibility and experience.

Attacking Better Planning

We further developed the content by focusing on Gunter’s second major reason for failed experiments: Poor planning. The Basics of Multifactor Experimentation includes a clear framework for experiment planning. When we created this course, we intentionally limited the statistical content. Why? To give us more time to adequately present a planning strategy. This is a step often overlooked by statisticians. Not us. This planning strategy urges you to:

- capture process knowledge with flow charts and process maps
- investigate and improve measurement capabilities for critical characteristics
- define process improvement priorities and agree on which ones to investigate
- focus on aspects more commonly recognized in setting up an experiment — like choosing responses, listing potential factors and other potentially influential variables (and deciding whether to hold them fixed or simply to measure them), identifying logistical/time issues and other limitations, etc.

My own experience is that when a company first considers using experiments, they tend to rush into the experiment without this necessary up-front work. Course participants will be challenged not to take such shortcuts.

Follow-Up to Ensure Success

Each company that participates in the Basics of Multifactor Experimentation receives a site visit from one of the Basics course faculty about two months following the course. This visit focuses on one or two applications that the participant identifies. Together, the faculty member and the participant review any course material needed and follow the planning strategy. We are committed. As part of our obligation to each participant, we will continue to stay in touch until a successful application is achieved.

Is the Three-Week Design of Experiments Institute still available?

The answer is both yes and no. We no longer offer a three-week course, but we do offer sequels to the one-week Basics of Multifactor Experimentation.

- On-Line Experimentation is a two-week course that teaches you how to experiment more efficiently using blocking, split-unit designs, analysis incorporating supplementary measurements (analysis of covariance), and other similar tools. The course assumes that you have successfully used two-level fractional factorial experiments.
- Two other sequels cover response surface methods (one week) and robust design (one-half week).

The Basics course and the three sequel courses do not overlap, since they stress different topics related to design of experiments. If you want to supplement the knowledge gained from applying the Basics of Multifactor Experimentation, we will help you decide which sequel course would best support your work setting and responsibilities.
Six Sigma, Black Belts, and UT's Practical Strategies for Process Improvement Institute
By Ramón v. León and Mary G. Leitnaker
Statistics Department, College of Business Administration

What are Six Sigma Programs?
Simply stated, six sigma is a program that reduces process variation and the defects it induces in all company processes. The six sigma movement had its origins at Motorola in the early 1980s and helped the company win the 1988 Malcolm Baldrige National Quality Award.

Today, many other companies such as General Electric, AlliedSignal, and Sony (to name just a few) use improved six sigma programs to achieve significant bottom line impact. Forbes magazine stated that the "secret" of Jack Welch, General Electric’s Chairman, is the company's six sigma program. Business Week reported that General Electric’s six sigma program delivered $320 million in productivity gains in 1997 and expected $750 million in net benefits in 1998. Jack Welch is quoted saying "six sigma has spread like wildfire across the company and it is transforming everything we do."

The name six sigma comes from a model of the process by which defects are generated. The statistical term σ (sigma) is used to quantify the amount of variation that can occur in a stable process. The model recognizes that variation in a process causes continuous quality characteristics to go out of specification. Six sigma performance means that the specification interval for a characteristic is very large compared to the process variation. (If you have already attended the Practical Strategies for Process Improvement Institute, you know six sigma performance corresponds to a Cp of 2.)

Six sigma programs start by identifying some key processes in a company and baselining the sigma performance. Then they use statistical and non-statistical quality improvement tools (such as process flowcharts and process maps, cause and effect diagrams, control charts, and design of experiments) to move the process from its current performance level to world class, six sigma performance. The tools, common to quality improvement programs, are taught in The Center’s Practical Strategies for Process Improvement Institute and Basics of Multifactor Experimentation Institute.

Why are Six Sigma Programs Effective?
The widespread use of the universal sigma scale of performance is the main difference between six sigma programs and other effective quality improvement programs championed by individuals such as Deming, Juran, and Ishikawa. With both types of programs, organizations must be committed to using data-driven methods to improve the product or service the customer receives. However, using the sigma scale of performance allows an organization to:
1. Establish clear performance goals
2. Track progress towards these goals and, in general
3. Maintain pressure for continuous process improvement.

When an organization starts a six sigma quality improvement program, it commits to:
- Treating all work as processes
- Improving these processes by systematically finding and reducing sources of variation
- Measuring process improvement using the universal sigma scale
- Striving for the world class six sigma level of performance, and
- Creating leadership and expertise within the organization in the form of certified Black Belts.

What is a Black Belt?
In the jargon of six sigma programs, a Black Belt is a person who can use quality improvement tools effectively and achieve significant bottom line impact. A Black Belt is the technical cornerstone of six sigma programs. To become Black Belt Certified, the candidate must:
- Complete the required curriculum
- Use quality improvement tools to complete a process improvement project — one that achieves a significant and permanent bottom line impact for the company
- Have the ability to influence and help others carry out similar process improvement projects.
How can The Center work with you in a Black Belt Program?

The Center certifies individuals and can also develop Black Belt programs for organizations. Individuals can become Black Belt Certified via a two-step program of coursework and project completion:

- Taking the Practical Strategies for Process Improvement Institute and Basics of Multifactor Experimentation Institute and successfully completing the institute project.
- Working with a UT faculty member to identify a significant project within your company that requires you to demonstrate leadership ability and command of the quality improvement tools. The faculty member will work with you throughout the project and will visit the work site at least once. After completing the project, you must demonstrate that the project had a significant and permanent bottom-line impact.

An organization can start and maintain a Black Belt Program through The Center by:

- Working with a UT faculty member to identify a series of important processes for improvement.
- Identifying a series of Black Belt candidates who will own the improvement of these processes.
- Working with a faculty member to identify the appropriate public or custom training.
- Having the UT faculty member work with Black Belt candidates to assure that significant and permanent improvements occur in the selected processes.

The Practical Strategies for Process Improvement Institute is a widely-respected UT program which presents practical, proven strategies for process improvement. The Institute is designed for process engineers, quality professionals and mid-to-upper-level managers with significant strategic and improvement responsibility.

References
The University of Tennessee, Knoxville, does not discriminate on the basis of race, sex, color, religion, national origin, age, disability or veterans status in provision of educational programs and services or employment opportunities and benefits. This policy extends to both employment by and admissions to the University. The University does not discriminate on the basis of race, sex, or disability in its educational programs and activities pursuant to the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990.

Inquiries and charges of violation concerning Title VI, Title IX, Section 504, ADA, the Age Discrimination in Employment Act (ADEA), or any of the other above referenced policies should be directed to the Office of Diversity Resources & Educational Services (DRES); 2110 Terrace Avenue, Knoxville, TN 37996-3560; telephone (865)974-2498 (TTY Available). Requests for accommodation of a disability should be directed to the ADA Coordinator at the Office of Human Resources Management; 600 Henley Street, Knoxville, TN 37996-4125.

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EXECUTIVE DEVELOPMENT PROGRAMS

General Management
Engineer/Scientist as a Manager (one week) June 25-30
Executive Development Program (four non-consecutive weeks) Feb. 6-12, Mar. 5-11, Apr. 9-15, May 15-19
Management Development Program (two non-consecutive weeks) Oct. 15-20, Nov. 12-17
Project Management: Beyond the Techniques (one week) Jan. 16-21

Logistics/Distribution
Geographic Information Systems (2-1/2 days) Oct. 22-24
Logistics Executive Development Program (one week) Apr. 30-May 5

Operations/Manufacturing
Asset Management (2-1/4 days) April 17-19, October 23-25
Basics of Multifactor Experimentation (one week) March 19-24, June 4-9, October 1-6

Implementation Programs
Black Belt Certification (ongoing)
Lean Implementation System (two series per year)

Marketing
Sales Forecasting Management (2-1/2 days) April 26-28, Nov. 1-3


EXECUTIVE MBA PROGRAMS

Executive MBA
The EMBA is a multiple mode program combining the best face-to-face classroom learning with state-of-the-art distance learning. It includes customized on-the-job learning applications and a personal leadership development program. The program can be completed in one year.
http://www.emba.utk.edu January start

Physician Executive MBA
The Physician Executive Masters in Business Administration (PEMBA) program is an advanced educational degree suited for physicians seeking high quality management and business operation skills.
www.pemba.utk.edu January start

Professional MBA
A fully integrated, lock step program, designed to serve the local community need for a top quality graduate business degree that can be earned in a compacted time frame and permits students to maintain full-time employment.
http://web.utk.edu/~promba August start

Taiwan Executive MBA
The Executive MBA program in Taiwan has been developed for upper level managers who are responsible for leading change in their organizations and motivating others.
web.utk.edu/~lemba/taiwan/taiwanhome.htm May start

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*Please note the change in area code to (865).