HAVE IT YOUR WAY! CUSTOMIZED SAS® TRAINING
A Case Study of the Texas Instruments Training Solution
Suzanne S. Scott, Texas Instruments Inc.

ABSTRACT
Texas Instruments (TI), like many companies, does not have an unlimited training budget. With that in mind, a course was needed that would introduce the user to the SAS® System as a whole, not just one specific part. While the SAS Institute offers many excellent courses, each covering only one product, TI needed a course that would cover several products and provide enough instruction to eliminate the need to attend (and pay for) multiple courses.

A condensed, combined course was designed, through consultations with the Institute Training Staff, that introduces 4 products: Base SAS®, SAS/Graph®, SAS/STAT®, and SAS/QC®. Now, after only one course, students are comfortable enough with the SAS system (in general) to tackle any program. This approach allows teaching an overview of the SAS System in four days, instead of the 14 days it would take with the available Institute courses.

BACKGROUND
Texas Instruments (TI) is a large manufacturing company employing approximately 50,000 people worldwide. Nine primary sites are clustered around the Dallas headquarters, with satellite sites sprinkled through Texas, the United States and the world. Use of the SAS system is slowly spreading through the many divisions of TI (i.e., Defense Systems, Semiconductor, Consumer Products, etc.), and is being used in vastly different business arenas. Consequently SAS applications at TI are very diverse, ranging from simple bar charts to complicated statistical analysis.

THE PROBLEM
Imagine the frustration a new SAS System user must feel when confronted with the expansive documentation. It takes approximately two feet on a bookshelf to store the books for TI's combination of products. Learning to use the SAS System independently is a difficult task at best. It quickly becomes obvious that some form of training is vital to ensure successful implementation of the software.

Many types of training are available through the Institute, including: Instructor-based, Video-based and Computer-based. After polling the SAS populace at TI, it was obvious that instructor-based training was the preferred method, especially if the class included hands-on labs. (Most people have trouble making time for training unless they go away to a class.)

The Institute offers many different instructor-based courses, each covering an individual product very thoroughly. If a large amount of time and money were available to the new SAS System user, it would be preferable to attend 5 or 6 different courses, thus learning each topic very well. Most SAS System users, however, do not have the necessary resources to approach training that way.

THE TI SOLUTION
The first idea considered at TI was to hold a session of the Institute's 'SAS Basics I' course. The problem is that, after 3 days in class, the student would be familiar with beginning level concepts of Base SAS software only. This would neither provide ample return on our investment of time and money, nor adequate coverage of the wide range of SAS System uses at TI.

Instead, after polling the SAS populace, the decision was made to combine parts of five courses, each touching on a commonly used product, into one:

SAS Basics 1  3 days
SAS Basics 2  2 days
SAS Color Graphics 1  3 days
Basic Statistics using SAS/STAT software  3 days
Basic Statistical QC  3 days

What would ordinarily take 14 days, was cut down to four. Of course the topics are not covered as thoroughly, but each is presented sufficiently to familiarize the student with the proper syntax and
uses. With this type of class, the student would gain a broader education in a shorter amount of time.

CURRICULUM

After consulting with the Institute Training Staff, the following material was consolidated from the original courses to form the new course:

1. Overview of the SAS System
2. Fundamental SAS Concepts
3. Reading and Processing Raw Data
4. Processing SAS Data Sets
5. Enhancing Printed Reports
6. Transforming Data Using the DATA Step
7. Storing and Accessing SAS Data Sets
8. Processing Date and Time Values
9. Introduction to SAS/GRAPH Software
10. Controlling Text Appearance
11. Producing Plots
12. Producing Charts
13. Shewhart Control Charts
14. Enhancing Shewhart Charts
15. Tests for Special Causes (Optional)
16. Pareto Charts (Optional)
17. Process Capability
18. Comparing Independent Populations
19. Regression
20. Analysis of Categorical Data (Optional)

Basically half of the time (2 days) is spent on Base SAS topics (Chapters 1 - 8); it is crucial to give the students a good foundation. The final 2 days are divided fairly equally between SAS/GRAPH (Chapters 9 - 12), SAS/QC (Chapters 13 - 17) and SAS/STAT (Chapters 18 - 20).

LABS

Hands-on labs are interspersed throughout the course for more effective learning. To provide this capability, it was necessary to utilize a room with multiple workstations. At TI, a training room was available centrally that is equipped with 17 Personal Computers (PCs) capable of running SAS software. In addition, a separate PC is positioned at the front of the room for the instructor. This PC is tied into an overhead projector which can display images from the instructor's PC on the screen in the front of the room. This allows the instructor to demonstrate actual examples of SAS programming and the subsequent results.

LUCKYLY the PCs are connected via a Local Area Network (LAN) thus simplifying the process of loading the SAS software to each workstation. It is only necessary to manually install the software once on the instructor's PC. A distribution program is then submitted to copy it to the student's workstations. Since it takes 2 to 3 hours to install the SAS System, this is a major time savings in preparing for the class.

At TI, most students prefer having their own workstation for the lab sessions. While they may consult with their neighbor about occasional problems that arise, most still want to complete the exercises on their own. To be sensitive to this preference, the class size was limited to 20, allowing most students to work alone.

COURSE LOGISTICS

The class is held once each quarter with approximately 20 students in attendance each time. It lasts from 8:30 am - 4:30 pm with an hour for lunch and spans four consecutive days.

Students are given a 'Course Notes' book containing copies of all transparencies used in lecture and the lab instructions. In addition, a diskette with a copy of the lab data is provided. These materials can be used to brush up on skills at a later time or even to teach a coworker.

An instructor from the Institute travels to Texas to teach the course, using a combination of lecture, lab, and actual demonstration as instructional methods.

Large placecards are printed for each student and positioned on their desks in easy view of the instructor. This has facilitated class discussion by allowing the instructor to call students by name.

Evaluation sheets are distributed at the end of the course and later summarized to determine areas of needed improvement. Occasionally it has been necessary to hold a course that covers a very specific topic such as SAS/AF® with SAS/FSP®, Macro Processing, etc. Generally, though, the 'Intro' course meets most training needs.

Upon completion of the course, students are added to our 'SAS mailing list' to keep them abreast of continuing educational opportunities. New classes, upcoming seminars, user's group meetings, etc. are communicated to those on the list via an internal electronic message system.
Cost for the course includes the standard SAS Institute on-site class fee (as published in SAS Training) plus travel expenses for the instructor.

CONCLUSION

The class has been very successful and popular among our employees. One factor that may contribute to the success of this course is the large population of engineers and statisticians at TI. Backgrounds of this type, heavy in math and statistical skills, allow students to easily grasp SAS System concepts. Although some have felt 'overloaded' from the large amount of information, most students appreciate the general background they gain. They are comfortable enough with the SAS System as a whole to tackle any new program.

FOR MORE INFORMATION

For more information please contact:

Suzanne Scott
M/S 8290
2553 Summit Ave.
Plano, TX 75074
(214) 578-5833

SAS, Base SAS, SAS/GRAPH, SAS/STAT, SAS/QC, SAS/AF and SAS/FSP software are registered trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.