



# WUSS FULL DAY AND HALF DAY COURSE DESCRIPTIONS

Pre/Post full-day classes offer even more opportunity to expand your SAS knowledge. Use the worksheet on pages 23-24 to plan your registration, then register online at [www.wuss.org](http://www.wuss.org). Full-day classes are \$250 each if you register **by October 5**, and \$300 each **after October 5**. Class attendees may receive class notes. In some classes, attendees receive a textbook and /or disk with sample programs. In other classes, attendees may purchase a textbook or bound course notes for an additional fee.

**Note:** The use of laptops and all recording devices is not permitted without the instructor's prior approval.

**Note:** WUSS, Inc. reserves the right to cancel any pre/post conference class(es), and if said occurs, then WUSS' liability is limited to the refund of any registration fee(s) paid for the canceled class(es).

## Monday Full-Day Classes

### **%Macro to %MEND: An Introduction to the SAS Macro Language – Art Carpenter**

This one-day course is designed for the SAS programmer who is new to the Macro Language. We will start at the basics and cover the fundamentals necessary to start applying SAS macros in your programs. By the end of the day you will understand how the Macro Language works, what the Macro Symbol Table is and how to values stored in it, how the SAS System uses Macro Variables, key Macro Language concepts, important SAS Macro Language Functions, and how to invoke Macros in your programs. The example Macros shown in the course materials demonstrate the power and flexibility of this part of the SAS System and will enable you to apply the functionality of the Macro Language to your own programs right away. This session is suited for the SAS user who already has a basic understanding of the Data Step and Procedure Steps, and who is new to the Macro Language facility in SAS System software. It is a beginning-level course that assumes no prior understanding of the SAS Macro Language. It is also suitable for SAS users who want to understand the Macros found in programs then have "inherited" from other programmers. Students in the macro classes will have the option of either bringing their own copy of the course book, Carpenter's Complete Guide to the SAS® Macro Language, 2nd Ed., or purchasing one for \$40.

### **The Nitty-Gritty of PROC Report – Mal J. Foley**

One of the most powerful PROCs in SAS is Proc REPORT. Just this one procedure does the yeoman's work of PROC PRINT, SORT, FREQ, MEANS, and TABULATE, and PUT-Statement Formatting (DATA \_NULL\_) combined. This seminar is for anyone interested in getting started with PROC REPORT. Through examples, it completely examines how to produce listings through the PRINT, SORT and DATA \_NULL\_ aspects of PROC REPORT. The seminar goes on to address the FREQ, MEANS and TABULATE aspects of PROC REPORT. The workshop briefly looks at alternatives to ODS. Come experience what PROC REPORT can do for your SAS programming.

### **Practical, Printable ODS – Presentation and Publication-Level Output from SAS – Pete Lund**

The SAS Output Delivery System (ODS) is a wonderful thing. It can help you create web pages, make datasets from procedures that don't do it on their own and send output to multiple destinations at the same time. But, one of the most powerful features of ODS is that it gives you the capability of creating high quality printable output that requires no post-hoc manipulation. This class will give you tips and tricks to use in creating PDF and

RFT files in your SAS jobs. We'll look at putting results from multiple procedures on the same page - even side by side. We'll explore new ways to mix text and graphic output in the same report. We'll see how we have lots of control over the appearance of reports produced by PROC REPORT and TABULATE, even down to affecting the look of a single cell. There are new ways to add blocks of text to your output to make your reports more understandable. We'll also take a look at some new things to come in version 9.2.

## **Tuesday Full-Day Classes**

### **Advanced Techniques in the SAS Macro Language – Art Carpenter**

This one day course is designed for students with a good understanding of the DATA and PROC steps and who already understand the basic structure and syntax of the SAS Macro Language. The course will start with a short review of the macro basics and quickly move on to topics selected to improve your macro language expertise. Several key macro functions will be introduced, explained and demonstrated. Course topics include: Macro Language Review; Macro Functions, Using and Creating; Writing Dynamic Code; Controlling Your Environment; Working With SAS Data Sets; SAS Macro Libraries; Miscellaneous Macro Topics. Students will have the option of either bringing their own copy of the course book, *Carpenter's Complete Guide to the SAS® Macro Language*, 2nd Ed., or purchasing one for \$40.

### **An Introduction to SQL and SAS – Pete Lund**

This course covers both SQL as a language and its implementation in SAS via PROC SQL. Topics include creating tables and views, inner and outer joins and unions. Also included are subsetting data with WHERE and HAVING statements and aggregating and summarizing data. Examples of using PROC SQL to interface with other DBMS, directly and via ODBC, will be covered as well. Comparisons of the efficiency of PROC SQL and other methods of manipulating data in SAS, via procedures or data step, will be given. At the end of the course, students will have an understanding as to which scenarios may be appropriate for SQL processing and the tools to write queries of medium complexity.

### **Best Practices in SAS Clinical Programming for Regulatory Submission – Sunil Gupta**

This one day intense course provides a good overview to meet the regulatory submission deadlines, to develop a clinical reporting system for producing publication-quality summary tables and data lists, and to show how to validate throughout the process. Get your SAS clinical programming and validation questions answered and learn efficient tips for producing a quality regulatory submission in a timely manner. Anyone directly or indirectly responsible for the creation, content or validation of summary tables, data lists and graphs used to support research, drug or medical device efficacy and safety in a regulatory submission will benefit from this course. This course is ideal for SAS Statistical Programmers and Managers, Statisticians, and Clinical Data Managers. For an additional fee, students may purchase the *Sharpening Your SAS Skills* book.

### **Merging, Combining and Subsetting SAS Data Sets – Mal Foley**

This class discusses over 30 common errors in merging, combining, or otherwise manipulating data. All of these errors result in erroneous data. Most of them occur with no SAS message or warning! In addition to examining errors, this covers a wide range of topics such as interleaving, subsetting, concatenations, the IN= data set option, BY groups, FIRST.variable, program data vectors (PDV), finding duplicate records, collapsing files, overlapping variables, random access, Cartesian products, one-to-one merges, match merges, SQL joins, and fuzzy merges. The workshop starts with the basics and continues to build up to complex and tricky examples of data set manipulation. The only prerequisite for the course is a working knowledge of the SAS DATA Step. Yet,

this workshop will give intermediate and advanced programmers a great review and some surprises. Come see what mysteries lurk in manipulating SAS files! Participants provided with complete copies of the slides used in class, bound book that includes reference materials and ample space to write take notes about the topics discussed.

### **SAS Performance Tuning Techniques – Kirk Paul Lafler**

As SAS Software becomes increasingly more popular among programmers and end-users; guidelines for its efficient use are critical. This course presents numerous tips and tricks to control and manage program execution, I/O, memory, disk space, and program maintenance. A collection of proven techniques and code examples are presented to illustrate numerous practical methods for gaining efficiency while using SAS Software.

### **Saturday Full-Day Classes**

#### **Advanced SAS Programming Techniques -- Kirk Paul Lafler**

SAS users who have acquired basic programming skills presented in a SAS Software Basics course and want to expand their knowledge with the DATA Step will want to attend the Advanced SAS programming Techniques course. Attendees will learn complex programming topics and techniques in the areas of data access, data manipulation, data management, data presentation, and much more. Topics include DATA Step programming techniques including reading a variety of input file formats; using column and line pointers; specifying system and language options; coding loops, ranges, and arrays; using operators and modifiers; testing and debugging techniques; reshaping columns of data; techniques on managing data; custom report writing techniques; and integrating ODS for improved output. Course notes are included.

#### **Exploratory Graphical Data Analysis in Model Building, Prediction and Classification**

**George Fernandez, PhD**

Data exploration and graphical data analysis methods stress visualization to thoroughly study the structure of data and to check the validity of statistical model fit to the data. This full-day course covers fundamental concepts for understanding and successfully applying data exploration and graphical data analysis methods by using the powerful user-friendly SAS macro applications. These concepts will be illustrated via downloadable SAS macro-call files. The participants will learn data exploration and graphical data analysis methods used in exploratory factor analysis, k-mean cluster analysis, multiple and logistic regression, and discriminant analysis. This workshop is intended for data analysts, predictive modelers, statistical consultants, and bio-statisticians, in advanced training in data exploration and graphical data analysis methods for increasing the effectiveness, efficiency, and productivity of research and development. Participants are required to have an understanding in basic statistical methods and an introductory working knowledge in SAS systems. Students receive a full set of lecture notes and unlimited access to use of the SAS macro applications (REGDIAG, LOGISTIC, FACTOR, DISJCLUS, and DISCRIM) covered in this workshop.

#### **PROC REPORT: intermediate and Advanced Topics - The Compute Block and the Process**

**Art Carpenter**

For many programmers it is difficult to take this highly flexible, very powerful, potential complex procedure past the basic steps. Much of the confusion lies with the compute block, and its process. To make matters worse

many of today's tables are to be imported into word processing documents and additional complexity is added when coordinating with the Output Delivery System. You do not have to be one of those with an incomplete understanding of PROC REPORT. This Seminar will show you how PROC REPORT thinks as it executes the compute block. Topics included in this seminar: Review of the REPORT step process; Review of the compute block; Understanding more about the LINE statement; Using SAS Language Elements in the compute block; Coordinating ODS with PROC REPORT - beyond the basics; Building linked documents; Traffic lighting; Incorporating graphics with your report; Using SAS/GRAPH to augment a table; Implementation of in-line formatting sequences. For additional fee students may purchase *Carpenter's Complete Guide to the SAS Report Procedure* book.

## Wednesday Half-Day Classes

### An Expert's Guide to Data Cleaning – Ron Cody

**Abstract:** Explore ways to look for data errors using both DATA step programming and Base SAS procedures. Functions such as VERIFY and several of the new SAS 9 character functions make SAS especially well suited to this task. In addition, it will briefly touch on the use of Perl regular expressions for data cleaning applications.

**Instructor Profile:** Dr. Ron Cody was a Professor at the Robert Wood Johnson Medical School in New Jersey for 26 years and consultant and writer. He has been a SAS user since the late 70's and is the author of "Applied Statistics and the SAS® Programming Language" (fifth edition), published by Prentice Hall. He has also authored or co-authored the following books for the SAS Institute as part of their Books by Users series: Learning SAS by Example A Programmer's Guide, SAS Functions by Example, The SAS Workbook, SAS Programming by Example, Cody's Data Cleaning Techniques, and Longitudinal Data and SAS: A Programmer's Guide. Ron has presented invited papers for numerous local, regional, and national SAS conferences.

### Output Delivery System (ODS) Tips and Tricks – Kirk Paul Lafler

**Abstract:** The SAS Output Delivery System (ODS) provides many ways to format output. ODS controls the way output is accessed and formatted. It continues to support the creation of traditional SAS monospace output (e.g., Listing), while providing many new features and greater flexibility when working with output. Many output formatting features and options are introduced for SAS users to take advantage of enabling "quality" output to be produced without having to import SAS output into word processors and other third party products. Topics include managing output destinations; accessing ODS output in the Results window; managing selection and exclusion lists; creating output data sets, PDF files, RTF files, spreadsheet files, HTML output, and XML output; concatenating procedure output; and building simple drill-down applications and thumbnail charts.

**Instructor Profile:** Kirk Paul Lafler is consultant and founder of Software Intelligence Corporation and has been programming in SAS since 1979. As a SAS Certified Professional and SAS Institute Alliance Member (1996 - 2002), Kirk provides IT consulting services and training to SAS users around the world. He has written four books including PROC SQL: Beyond the Basics Using SAS by SAS Institute, Power SAS and Power AOL by Apress, as well as more than two hundred peer-reviewed papers and articles. Kirk has been invited as a speaker and workshop presenter at more than two hundred International, Regional, and Local SAS User Group Conferences. He also writes a popular SAS Tips column called Kirk's Korner that appears regularly in the BASAS, HASUG, SANDS, SAS Institute, SESEG, and WUSS Newsletters and websites. He can be reached at [kirklafler@cs.com](mailto:kirklafler@cs.com).

## Sharpening Your SAS Skills: Preparing for SAS Base Certification – Sunil Gupta

**Abstract:** Ready to gain that competitive edge in SAS programming by taking the SAS Base Programming exam? Learn how to read, understand and write better SAS programs. Understand the key differences between similar SAS syntax and programming approaches. Save time in writing SAS code with organized summaries of important facts. Improve your trouble-shooting skills in common programming and data related problems. This course shows how to write and diagnose the most common programming tasks in data access and data management. Each example will help you to better understand the SAS syntax by showing results expected from the input data and potential errors, notes or warning messages that may be generated if written incorrectly. This class also includes a review of sample test questions to help you better understand and pass the exam. Take your knowledge to the next level with practical tips and frequently asked questions. Students will receive the course notes. For additional fee, students may purchase the *Sharpening Your SAS Skills* book.

**Instructor Profile:** Sunil is the Associate Director of Statistical Programming at Quintiles. He has been using SAS software for over 13 years, is a SAS Base Certified Professional and was the program chair for the Western Users of SAS Software conference in 1998. He has also been an invited speaker at numerous SAS User Group International and regional conferences. He has over 47 publications, and is the coauthor of *Sharpening Your SAS Skills*, the book to help users better understand and analyze the SAS programming language. He is also the author of *Quick Results with the Output Delivery System*, and was a SAS Institute Quality Partner for over 5 years. Recently, he released his third book titled *Data Management and Reporting Made Easy with SAS Learning Edition 2.0*.

## Testing and Validating SAS Programs in an FDA Regulated Environment – Neil Howard

**Abstract:** This seminar will focus on testing and validating SAS programs, particularly in the context of an FDA regulated environment, with special emphasis on SAS tips and techniques to facilitate this process: WHY: examination of FDA regulations and guidances; exploration of reviewers' expectations (processes and accountability); implications of audits; and discussion of client requirements and specifications.

**Instructor Profile:** Neil Howard is Director of Biostatistical Programming for Clinical Development at Amgen Inc.; she is therapeutic area head over Inflammation and General Medicine. She has been a SAS user and trainer for more than twenty years; she has a background as manager of statistical programmers in both CRO and big pharma environments. She's been an invited speaker and trainer since 1983 on such topics as: efficiency techniques, DATA step processing and internals, advanced DATA step techniques, testing and validation, graphics, effective presentations, and interviewing/hiring SAS programmers. She was a contract instructor for SAS Institute for seven years teaching fundamentals, programming, macro, report writing, graphics and the annotate facility. She has been a member of the SUGI Executive Committee since 1993 and was proud to chair SUGI 20 in Orlando.

## Using SAS Enterprise Guide – Ginger Carey and Helen Carey

**Abstract:** SAS Enterprise Guide is a point-and-click interface to the SAS System and is used by business analysts, statisticians, researchers and programmers. This course shows how to use SAS Enterprise Guide to retrieve information from various sources, analyze the data and present the results. Topics include navigating the menus, managing and manipulating the data, performing exploratory data analysis, reviewing the generated code, creating graphs, drag and drop reporting, and consolidating the results into one document using the Document Builder. This course will be using the latest version of SAS Enterprise Guide and is appropriate for both new SAS users and SAS programmers who are new to SAS Enterprise Guide.

**Instructor Profiles:** Helen works in the insurance industry providing SAS and SQL programming and is an independent computing and training consultant. Ginger provided technical support and classes for SAS users

at the University of Hawaii for 30 years. She recently retired from the university and is an independent consultant. Ginger co-chaired WUSS '95. Both are experienced programmers using a variety of features and products of the SAS System. Helen and Ginger have given invited and contributed papers at WUSS and SUGI conferences and local users groups. They have provided training classes for WUSS for the past few years. They have also served as Section Chairs at numerous SUGIs and at WUSS. Helen and Ginger co-authored a book in the SAS Books by Users Series: SAS Today! A Year of Terrific Tips. They believe in the need for constant learning and their philosophy is to have fun while learning.

### **CDISC SDTM Implementation with Real World Applications – Sy Truong**

**Abstract:** Implementation of the CDISC data models is no longer a theoretical academic exercise but is now entering the real world. This course will walk you through the lessons learned from implementations of CDISC SDTM version 3.1.1 and ADaM 2.0. It will cover both technical challenges along with methodologies and processes.

**Instructor Profile:** Sy Truong is the cofounder and president of MXI (Meta-Xceed, Inc.) since 1997. MXI provides software solutions within the Pharmaceutical Industry specializing in CDISC data standards, SAS validation, electronic submission, data analysis and reporting. Sy is one of the committee members of the Bay Area SAS User Group ([www.basas.com](http://www.basas.com)). He is a frequent contributor and presenter at PharmaSUG, WUSS, and SUGI conferences. He's currently writing a book for SAS Publishing entitled Becoming a SAS Clinical Trials Programmer.

### **Friday Half-Day Classes**

#### **Intro to SAS XML Libname Engine – Linda Jolley**

**Abstract:** This seminar is designed for users who want to import structured XML files into SAS data set format or export structured XML files from SAS data sets. Hands-on demonstrations illustrate various export formats. Also covered is the use of the XMLMap facility and the SAS XML Mapper graphical user interface to map hierarchically arranged XML into SAS data set format. This course includes a brief introduction to Tagset Templates and how they can be modified with the TEMPLATE procedure for use with the SAS XML LIBNAME engine.

**Instructor Profile:** Linda Jolley has been an instructor in the Education Division at SAS Institute for over ten years, where she teaches Base SAS, web enablement, Live Web, and SAS Scalable Performance Data Server classes. Prior to coming to SAS, she had 16+ years' experience as a SAS software programmer and consultant in private industry.

#### **Powerful, Yet Less Commonly Used: Procedures and Techniques That You Should Know**

##### **Art Carpenter**

**Abstract:** The SAS System includes a vast array of tools that provide the programmer with a vast amount of power to do all sorts of things. Just in the Base system alone there are over 50 procedures and more are being added with each new release of the software. Some of these procedures and techniques you will probably never use, and some although very useful are very underutilized. A few of these underutilized procedures are new, some of the techniques are perceived to be difficult to learn. All offer huge benefits to the programmers that can make use of them. This seminar will cover a number of these underutilized, but often extremely

powerful and useful procedures and techniques. Although of potential value to programmers of any ability level this Seminar is designed for newer and intermediate level programmers.

**Instructor Profile:** Art Carpenter's publications list includes four books, and numerous papers and posters presented at SAS Global Forum, SUGI, and other user group conferences. Art has been using SAS since 1976 and has served in various positions in local, regional, national, and international user groups. He is a SAS Certified Advanced Programmer and through California Occidental Consultants he teaches SAS courses and provides contract SAS programming support nationwide. Art's website is [www.caloxy.com](http://www.caloxy.com)

### **SAS Macro Programming Tips and Tricks – Kirk Paul Lafler**

**Abstract:** The SAS Macro Language is a powerful tool for extending the capabilities of the SAS System. This course presents numerous tips and tricks in the construction of effective macros through the demonstration of a collection of proven Macro Language coding techniques. Attendees learn how to process statements containing macros; replace text strings with macro variables; generate SAS code using macros; combine macro variable references with text; manipulate macro variable values with macro functions; compile and execute a compiled macro; handle global and local variables; construct arithmetic and logical expressions; use macro quoting functions; interface the macro language with other languages including the DATA step and SQL procedures; store and reuse macros; troubleshoot and debug macros; and develop efficient and portable macro language code.

**Instructor Profile:** Kirk Paul Lafler is consultant and founder of Software Intelligence Corporation and has been programming in SAS since 1979. As a SAS Certified Professional and SAS Institute Alliance Member (1996 - 2002), Kirk provides IT consulting services and training to SAS users around the world. He has written four books including PROC SQL: Beyond the Basics Using SAS by SAS Institute, Power SAS and Power AOL by Apress, as well as more than two hundred peer-reviewed papers and articles. Kirk has been invited as a speaker and workshop presenter at more than two hundred International, Regional, and Local SAS User Group Conferences. He also writes a popular SAS Tips column called Kirk's Korner that appears regularly in the BASAS, HASUG, SANDS, SAS Institute, SESEG, and WUSS Newsletters and websites. He can be reached at [kirklafler@cs.com](mailto:kirklafler@cs.com).