SAS® Financial Data Analyst

Course 1 - BASE SAS PROGRAMMER

- **Module 1 - SAS Programming 1: Essentials**

Duration: 3 days Level: Fundamental

This course is for users who want to learn how to write SAS programs to access, explore, prepare, and analyze data. It is the entry point to learning SAS programming for data science, machine learning, and artificial intelligence. It is a prerequisite to many other SAS courses. If you do not plan to write SAS programs and you prefer a point-and-click interface, you should attend the *SAS Enterprise Guide 1: Querying and Reporting* course.

Learn how to

- use SAS Studio and SAS Enterprise Guide to write and submit SAS programs
- access SAS, Microsoft Excel, and text data
- explore and validate data
- prepare data by subsetting rows and computing new columns
- analyze and report on data
- export data and results to Excel, PDF, and other formats
- use SQL in SAS to query and join tables.

Who should attend
Anyone starting to write SAS programs

Prerequisites
Before attending this course, you should have experience using computer software. Specifically, you should be able to

- understand file structures and system commands on your operating systems
- access data files on your operating systems.

No prior SAS experience is needed.

Software Addressed

Base SAS This course also addresses SAS/ACCESS Interface to PC Files.

Course Contents

Essentials

- the SAS programming process
- using SAS programming tools
- understanding SAS syntax

Accessing Data

- understanding SAS data
- accessing data through libraries
- importing data into SAS

Exploring and Validating Data

- exploring data
- filtering rows
- formatting columns
- sorting data and removing duplicates

Preparing Data

- reading and filtering data
- computing new columns
- conditional processing

Analyzing and Reporting on Data

- enhancing reports with titles, footnotes, and labels
- creating frequency reports
- creating summary statistics reports

Exporting Results

- exporting data
- exporting reports

Using SQL in SAS

- using Structured Query Language in SAS
- joining tables using SQL in SAS

- **Module 2 - SAS Programming 2: Data Manipulation Techniques**

Duration: 3 days Level: Intermediate

This course is for those who need to learn data manipulation techniques using the SAS DATA step and procedures to access, transform, and summarize data. The course builds on the concepts that are presented in the *SAS Programming 1: Essentials* course and is not recommended for beginning SAS software users.

Learn how to

- understand and control DATA step processing
- create an accumulating column and process data in groups
- manipulate data with functions
- convert column type
- create custom formats
- concatenate and merge tables
- process repetitive code
- restructure tables.

Who should attend
Business analysts and SAS programmers

Prerequisites
Before attending this course, you should be able to do the following:

- write DATA step code to subset rows and columns, compute new columns, and process data conditionally
- sort tables using the SORT procedure
- apply SAS formats

Software Addressed
Base SAS

Course Contents

Controlling DATA Step Processing

- setting up for this course
- understanding DATA step processing
- directing DATA step output

Summarizing Data

- creating an accumulating column
- processing data in groups

Manipulating Data with Functions

- understanding SAS functions and CALL routines
- using numeric and date functions
- using character functions
- using special functions to convert column type

Creating Custom Formats

- creating and using custom formats
- creating custom formats from tables

Combining Tables

- concatenating tables
- merging tables
- identifying matching and nonmatching rows

Processing Repetitive Code

- using iterative DO loops
- using conditional DO loops

Restructuring Tables

- restructuring data with the DATA step
- restructuring data with the TRANSPOSE procedure

Module 2- SAS Certified Predictive Modeler Using SAS Enterprise Miner 14

- **Module 3 - SAS Enterprise Guide: ANOVA, Regression, and Logistic Regression**

Duration: 3.0 days Level: Intermediate

This course is designed for SAS Enterprise Guide users who want to perform statistical analyses. The course is written for SAS Enterprise Guide 8.1 along with SAS 9.4, but students with previous SAS Enterprise Guide versions will also get value from this course. An e-learning course is also available for SAS Enterprise Guide 7.1 and SAS Enterprise Guide 5.1.

Learn how to

- Generate descriptive statistics and explore data with graphs.
- Perform analysis of variance.

- Perform linear regression and assess the assumptions.
- Use diagnostic statistics to identify potential outliers in multiple regression.
- Use chi-square statistics to detect associations among categorical variables.
- Fit a multiple logistic regression model.

Who should attend
Statisticians and business analysts who want to use a point-and-click interface to SAS

Prerequisites
Before attending this course, you should:

- Be familiar with both SAS Enterprise Guide and basic statistical concepts.
- Have completed an undergraduate course in statistics covering *p*-values, hypothesis testing, analysis of variance, and regression.
- Be able to perform analyses and create data sets with SAS Enterprise Guide software. You can gain this experience by completing the *SAS Enterprise Guide 1: Querying and Reporting (Enterprise Guide 5.1 - 7.1)* course.

Software Addressed

SAS Analytics Pro, SAS Enterprise Guide, SAS/STAT This course also addresses Base SAS software and touches on SAS/GRAPH and SAS/STAT software. You benefit from this course even if SAS/GRAPH software is not installed at your location.

Course Contents

Prerequisite Basic Concepts

- Discussing descriptive statistics.
- Discussing inferential statistics.
- Listing steps for conducting a hypothesis test.
- Discussing the basics of using your SAS software.

Getting Started in SAS Enterprise Guide 7.1

- Introducing the SAS Enterprise Guide 7.1 environment.

Introduction to Statistics

- Discussing fundamental statistical concepts.
- Examining distributions.
- Describing categorical data.
- Constructing confidence intervals.
- Performing simple tests of hypothesis.

Analysis of Variance (ANOVA)

- Performing one-way ANOVA.
- Performing multiple comparisons.
- Performing two-way ANOVA with and without interactions.

Regression

- Using exploratory data analysis.
- Producing correlations.
- Fitting a simple linear regression model.
- Understanding the concepts of multiple regression.
- Building and interpreting models.
- Describing all regression techniques.
- Exploring stepwise selection techniques.

Regression Diagnostics

- Examining residuals.
- Investigating influential observations and collinearity.

Categorical Data Analysis

- Describing categorical data.
- Examining tests for general and linear association.
- Understanding the concepts of logistic regression and multiple logistic regression.
- Performing backward elimination with logistic regression.

- **Module 4 - Applied Analytics Using SAS Enterprise Miner**

Duration: 3.0 days Level: Intermediate

This course covers the skills that are required to assemble analysis flow diagrams using the rich tool set of SAS Enterprise Miner for both pattern discovery (segmentation, association, and sequence analyses) and predictive modeling (decision tree, regression, and neural network models). **This course is appropriate for SAS Enterprise Miner 5.3 up to 15.1.**

Learn how to

- Define a SAS Enterprise Miner project and explore data graphically.
- Modify data for better analysis results.
- Build and understand predictive models such as decision trees and regression models.
- Compare and explain complex models.
- Generate and use score code.
- Apply association and sequence discovery to transaction data.

Who should attend
Data analysts, qualitative experts, and others who want an introduction to SAS Enterprise Miner

Prerequisites
Before attending this course, you should be acquainted with Microsoft Windows and Windows software. In addition, you should have at least an introductory-level familiarity with basic statistics and regression modeling. Previous SAS software experience is helpful but not required.

Software Addressed

SAS Enterprise Miner

Course Contents

Introduction

- Introduction to SAS Enterprise Miner.

Accessing and Assaying Prepared Data

- Creating a SAS Enterprise Miner project, library, and diagram.
- Defining a data source.
- Exploring a data source.

Introduction to Predictive Modeling: Predictive Modeling Fundamentals and Decision Trees

- Introduction.
- Cultivating decision trees.
- Optimizing the complexity of decision trees.
- Understanding additional diagnostic tools (self-study).
- Autonomous tree growth options (self-study).

Introduction to Predictive Modeling: Regressions

- Selecting regression inputs.
- Optimizing regression complexity.
- Interpreting regression models.
- Transforming inputs.
- Categorical inputs.
- Polynomial regressions (self-study).

Introduction to Predictive Modeling: Neural Networks and Other Modeling Tools

- Input selection.

- Stopped training.
- Other modeling tools (self-study).

Model Assessment

- Model fit statistics.
- Statistical graphics.
- Adjusting for separate sampling.
- Profit matrices.

Model Implementation

- Internally scored data sets.
- Score code modules.

Introduction to Pattern Discovery

- Cluster analysis.
- Market basket analysis (self-study).

Special Topics

- Ensemble models.
- Variable selection.
- Categorical input consolidation.
- Surrogate models.
- SAS Rapid Predictive Modeler.

Case Studies

- Banking segmentation case study.
- Website usage associations case study.
- Credit risk case study.
- Enrollment management case study.

Course 3- SAS® Visual Business Analyst

- **Module 5 - SAS Visual Analytics 1 for SAS Viya: Basics**

Duration: 14.0 hours Level: Beginner

This course provides an introduction to data preparation, data discovery, and report creation in SAS Visual Analytics.

Learn how to use SAS Visual Analytics for SAS Viya to

- Organize content in SAS Drive.
- View and interact with reports using SAS Visual Analytics.
- Access and investigate data in SAS Visual Analytics.
- Prepare data using Data Studio.
- Perform data discovery and analysis using SAS Visual Analytics.
- Create interactive reports using SAS Visual Analytics.

Who should attend

Business analysts who need an introduction to the functionality provided by SAS Visual Analytics

Prerequisites

No SAS experience or programming experience is required, although you should have some computer experience. Specifically, you should be able to:

- Log on and off a computer and use a keyboard or mouse.
- Use a Web browser to access information.

Software Addressed

SAS Visual Analytics

Course Contents

Getting Started with SAS Visual Analytics

- Introduction to SAS Visual Analytics.
- Exploring the SAS Visual Analytics course environment.
- Viewing SAS Visual Analytics reports.

Preparing Data in SAS Data Studio

- Investigating data in SAS Visual Analytics.
- Transforming data using Data Studio.

Analyzing Data in SAS Visual Analytics

- Working with data items.
- Exploring data with charts and graphs.
- Creating data items and applying filters.
- Performing data analysis (relationship charts).

Designing Reports with SAS Visual Analytics

- Creating a simple report.

- Creating interactive reports.
- Working with display rules.

- **Module 6 - SAS Visual Analytics 2 for SAS Viya: Advanced**

Duration: 14.0 hours Level: Advanced

This course describes advanced features of data preparation, analytics, and report creation in SAS Visual Analytics.

Learn how to use SAS Visual Analytics for SAS Viya to

- Use automated explanation in SAS Visual Analytics.
- Restructure data for analytics (geographic analysis, forecasting, network analysis, path analysis, text analytics) using SAS Data Studio.
- Perform advanced analyses (geographic analysis, forecasting, network analysis, path analysis, text analytics) using SAS Visual Analytics.
- Create advanced data items using SAS Visual Analytics.
- Create advanced filters using SAS Visual Analytics.
- Create advanced interactive reports with parameters using SAS Visual Analytics.

Who should attend
Business analysts who need to use advanced functionality provided by SAS Visual Analytics

Prerequisites
This course builds on the knowledge gained by attending the *SAS Visual Analytics 1 for SAS Viya: Basics* course.

Software Addressed

SAS Visual Analytics, SAS Viya

Course Contents

SAS Visual Analytics Overview

- Overview of SAS Visual Analytics.
- Automated explanation.

Restructuring Data for Geographic Mapping

- Introduction to SAS Data Studio.
- Restructuring data.
- Analyzing geographic information.

Restructuring Data for Forecasting

- Restructuring data.
- Forecasting.

Performing Network Analysis

- Restructuring data for network analysis.
- Creating a network analysis object.

Performing Path Analysis

Performing Text Analytics

Creating Advanced Data Items

- Creating calculated items.
- Creating aggregated measures.

Creating Advanced Filters

- Creating advanced filters.
- Creating advanced interactive filters.

Using Parameters to Create Advanced Reports

- Using numeric parameters.
- Using character parameters.
- Using date parameters.

Course 4 - SAS Solutions for RISK and IFRS : An Introduction

Course Objective:

- To provide an overview of concepts in risk ,IFRS9 & IFRS17
- To provide applications of SAS solutions in risk, IFRS9 & IFRS17 and applications
- To demonstrate the generic process in IFRS9 and IFRS17.

Duration: 2 days

Learning Objectives:

After attending the course, the participants should be able to :

- Describe major risks involved in a financial institution
- List major SAS Solutions in Risk and Finance
- Describe major points in IFRS9 and IFRS17

- Describe general process involved in SAS Solutions for IFRS9 and IFRS17.

Course outline:

Major Risks for Financial Institutions

- Risk defined
- Types of Risk
- Regulatory Bodies in Risk

Major Regulations Overview

- Basel Accords
- IFRS9
- IFRS17

SAS Solutions for Risk

- SAS for Credit and Market Risk
- SAS for Operational Risk
- SAS for IFRS9
- SAS for IFRS17

SAS for IFRS9

- Solution Components
- SAS process for IFRS9
- SAS Outcomes and Disclosure reports

SAS for IFRS17

- Solution Components
- SAS process for IFRS17
- SAS Outcomes and Disclosure reports