



# Learn with Newtyne

## Introduction to PROC SQL(Level 1) – the Language of SAS

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**Duration:** 2 – 3 hours (plus additional time for exercises)

### Learning Overview:

This learning pathway will give you an introduction into the use of PROC SQL in the language of SAS.

There are mini quizzes and comprehensive exercises throughout to help assess and reinforce your learning.

### Learning Outcomes:

By the end of this course, you will be able to:

1. Describe how to implement SQL within the language of SAS.
2. Describe how to subset data to select columns and rows.
3. Explain how to summarise and classify data.

### Pre-requisites:

To get the most out of this course, it is expected that you should have attended the Fundamentals – the Language of SAS course (or comparable course of study).

If not, we would advise that you have at least six months experience of developing code in the language of SAS, including:

- Building DATA and PROC steps
- Character, Numeric and Date functions
- KEEP and DROP to select variables
- IF and WHERE statements to select observations
- Conditional Processing with IF-THEN-ELSE
- Summarising Data with the FREQ, MEANS and TABULATE procedures.

A prior understanding of SQL is not required.

For the hands-on practice activities in the course, you will need access to an environment that runs the programming Language of SAS. On our courses, we signpost you to some of the free tools available.

Check out the link below to review system requirements:

- [SAS® OnDemand for Academics](#)

## **Learning Modules:**

### **Introduction to SQL Language Elements**

*Learning Objective: Explain how to implement SQL within the language of SAS;*

- Origins of Structured Query Language (SQL)
- Implementing SQL within the Language of SAS
- SQL Language Elements

### **Selecting COLUMNS & ROWS**

*Learning Objective: Describe how to subset data to select columns and rows.*

- Selecting Columns
- The DESCRIBE and FEEDBACK options
- Create Columns
- The CASE Expression
- Selecting Rows
- Special WHERE Operators
- CALCULATED Rows

### **Summarising Data**

*Learning Objective: Explain how to summarise and classify data*

- Producing Summary Statistics
- Columns created by a query
- Classifying Data – GROUP BY
- Summary Statistics by Group
- Selecting Summarised Data – HAVING

## **Reference Modules:**

The following reference modules are included to support your learning:

### **Introduction to SAS Programming**

*Learning Objective: Explain what the Language of SAS is used for and by whom.*

- Explanation about SAS and who uses it
- Data Access
- Data Management
- Data Analysis
- Data Presentation

## Basic Concepts

*Learning Objective: Explain how the Language of SAS is used to access, manage, analyse and present data.*

- What is a dataset, a database and a relational database?
- Libraries, LIBREFS, LIBNAME statement
- Referencing a dataset
- The Data Step procedure
- Basic Procedures including PROC MEANS and PROC PRINT

## Investigating SAS datasets

*Learning Objective: Define how to investigate datasets in the Language of SAS using two types of Procedure.*

- The PRINT procedure
- Metadata, the CONTENTS procedure
- Types of data

## Programming Concepts

*Learning Objective: Describe the key programming concepts within the Language of SAS.*

- Program components – Data Steps and Procedures
- Programming language is made up of statements, expressions, functions & call routines, options, formats, and informats
- Managing Syntax errors
- Naming conventions

## Data Step Processing

*Learning Objective: Explain how the two phases of Data Step Processing work to create new datasets and variables.*

- *Data Step syntax: The DATA and SET Statements*
- Creating Datasets
- Creating Variables
- Data Step processing, i.e. what goes on in the background when you submit your data step code.

## Selecting Variables and Observations

*Learning Objective: Define Variables and Observations to be read from and written to datasets.*

- *KEEPing and DROPing Variables*
- The IF Statement
- The WHERE Statement
- FIRSTOBS= and OBS=
- IS NULL or IS MISSING
- BETWEEN-AND
- CONTAINS (?) and SOUNDS LIKE (=\*)