

Syllabus Introduction to SAS for Public Policy

Heinz 94-827 (Section A3)

Time: 4:50 PM to 6:10 PM, Tuesday and Thursday

Location: Room HBH 1002

Instructor: Gerald Hunter

- Email: geraldh@andrew.cmu.edu
- Office hours:
 - Monday 9:00 to 11:00 PM (Zoom)
 - Friday Noon to 1:30 PM (Zoom)
 - By appointment

Recommended Text: *The Little SAS Book: A Primer* by Delwiche & Slaughter. 6th edition.

Course Description

This course provides an introduction to the SAS programming applications with examples from real world policy analysis. We will cover data step programming, basic SAS procedures, macros, and some statistical procedures like linear and logistic regressions. We will use SAS procedures to explore data and identify characteristics and trends within the data. While the course is designed to provide SAS programming skills, it will be an opportunity to apply statistical procedures learned in other courses.

Course objectives

Upon completion of the course, students should be able to:

- Identify and correct common types of data errors within a dataset
- Import, export, combine, and transform data sets
- Perform basic analyses using common procedures
- Understand and describe basic framework of a SAS program written by others
- Format and present output for public consumption in several file types
- Perform iterative processing

Grading

Grades will be based on weekly assignments homework assignments (60%) and a final exam (40%). Weekly assignments will be posted Tuesday morning and are due 11:59 PM on Monday of the following week. Assignments should be submitted electronically on Canvas. The final exam will be a take home exam and is due Friday, March 19th at 11:59PM. It will involve using SAS techniques covered in this course to analyze datasets and to report results of the analysis. It will also involve interpreting SAS code and answering code-related questions. The final should reflect a student's individual ideas and work.

Course Policies

- Use of technology in the classroom: Research on learning shows that unexpected noises and movement divert people's attention, which means you are affecting your colleagues' learning experience if you are using your computers for random personal activities.
- Late homework policy: If for some substantial reason you cannot turn in your homework on the due date, you should contact me prior to the due date. You will only be eligible for 85% of the total points if the homework is one day late, 70% if the homework is two days late. No homework will be accepted two days after the due date.
- Discussion among individual students about assignments is permitted and encouraged. If you work with other students on the homework, list the names of the students at the top of your turned in homework (SAS program). It is important to remember though that the completed assignment must be your own work. Code and other answers should not be copied from another person or any other source. While coding problems are often very specific, the exact details of how the program was written will vary from student to student. The same applies to the presentation and interpretation of statistical results. Submissions where these details are identical or nearly identical, either among students or with another source, will be regarded as cheating. The minimum sanction for copying or other forms of cheating on a homework assignment is the loss of credit equal to two assignments, and sanctions may range up to the termination of your enrollment at CMU. All suspected incidents will be recorded with Heinz College administration at the same time the student is notified.

Schedule

Each class session will include a lecture at the beginning of the class. The lectures are designed to be partially interactive, where students perform some of the same steps being demonstrated during the lecture. Following the lecture, there will be time to practice the programming and perhaps time to work on the homework assignments. I will be available throughout the class period to answer questions as they come up. In some sessions we will review pre-written code, while in others we will write code together.

The schedule of topics may change depending on class interests and progress from week to week.

- Week 1: Introduction
 - SAS basics, libraries, variables, syntax
 - Procedures: CONTENTS, PRINT, MEANS, FREQ, TABULATE
 - Data Steps: set options, statements
 - Getting data into SAS (IMPORT)
- Week 2: Data Processing, part I
 - SAS dates
 - Conditional processing (if-then-else)
 - SAS functions

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- PROC FORMAT
- Week 3: Data Processing, part II
 - Combining data sets
 - SQL in SAS
 - DO blocks, Arrays, and Loops
- Week 4: Transforming data
 - PROC TRANSPOSE
 - ODS output data sets and external file types (pdf, rtf, excel)
 - RETAIN statements
 - Exporting to other file formats
- Week 5: Basic Statistical procedures
 - T-Tests
 - Logistic Regression (LOGISTIC)
 - Chi-square tests (FREQ)
 - Correlations (CORR)
- Week 6: Survey Procedures and Macros
 - Iterative processing and flexible routines
 - OLS regression (REG, GLM)
 - Statistical procedures using survey data
 - *Helpful tips*
 - *Review of key concepts*
 - *Useful resources*