



THE UNIVERSITY OF ARIZONA

Mel & Enid Zuckerman
College of Public Health

**Mel and Enid Zuckerman College of Public Health
University of Arizona**

BIOS 576D Data Management and the SAS Programming Language

Catalog Description: This course will introduce students to the fundamentals of data management using the SAS programming language. Emphasis will be placed on data manipulation, including reading, processing, recoding, and reformatting data. The approach will be to teach by example, with an emphasis on hands-on learning. (3 units)

Course Topics:

- Working with Data in SAS
- Modifying and Combining SAS Data Sets
- Data Visualization
- SAS Macros
- SAS SQL

Course Objectives: During this course, students will:

- Demonstrate basic and intermediate data management, reporting, and programming skills using the SAS v9.4 programming language.
- Perform macro programming tasks within SAS such as text substitution in code, automating and customizing the production of SAS code, and conditionally or iteratively constructing SAS code.
- Demonstrate skills in structured query language (SQL) programming within SAS, optimizing SAS programs such as querying and sub-setting data, summarizing and presenting data, and combining tables including inner and outer joins.

Learning Outcomes (Competencies Obtained): Upon completion of this course students will be able to:

1. Ability to identify appropriate statistical tools to address specific scientific questions
2. Demonstrate excellent written presentation skills and the ability to explain statistical concepts and findings to a general scientific audience
3. Demonstrate skills in data management to handle a variety of practical problems in data format and structure
4. Demonstrate advanced working skills in application of computer systems and appropriate statistical software
5. Demonstrate understanding of basic concepts of probability, random variation and commonly used statistical probability distributions
6. Suggest preferred methodological alternatives to commonly used statistical methods when assumptions are not met
7. Communicate understanding of the assumptions necessary for a given statistical procedure as well as the ability to determine if the assumptions are met for a given study design or data set