



THE UNIVERSITY OF ARIZONA

Mel & Enid Zuckerman
College of Public Health

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

BIOS 576A Biostatistics in Public Health

Catalog Description: This course introduces biostatistical methods and applications, and will cover descriptive statistics, probability theory, and a wide variety of inferential statistical techniques that can be used to make practical conclusions about empirical data. Students will also be learning to use a statistical software package (STATA or SAS). (3 units)

Course Topics:

- Descriptive Statistics
- Probability
- Estimation
- Regression & Correlation Methods
- Nonparametric Methods
- Categorical Data
- Hypothesis Testing – One and Two-Sample Inference

Course Objectives: During this course, students will:

- Identify the properties of given data sets, including the level of measurement for each variable.
- Apply appropriate descriptive statistics to the data according to its measurement type.
- Apply appropriate inferential statistics to the data according to its measurement type.
- Formulate and test hypotheses.
- Use a computer statistical software package (Stata, SAS or R) to accomplish these objectives.
- Apply your statistical knowledge to the design of research studies, including selection of proper research design and determination of sample sizes necessary to show statistical significance.
- Interpret and critique medical and scientific journal articles which frequently rely heavily on statistical procedures.

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

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
4. Interpret results of data analysis for public health research, policy or practice
5. Communicate audience-appropriate public health content, both in writing and through oral presentation
6. Select appropriate research designs to meet the needs of various studies, and be able to explain the limitations of implemented designs
7. Demonstrate understanding of basic concepts of probability, random variation and commonly used statistical probability distributions
8. Suggest preferred methodological alternatives to commonly used statistical methods when assumptions are not met