Data Analysis with R and SAS  
Course number: BE8083

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Class hours: TuTh 11:00AM - 12:30PM  
Office hours: TuTh 10:00AM - 11:00AM

Course Description: In this course, we will exemplify the role of the computing software R and SAS in data analyses. The course will cover the basics of R (including data structures; data manipulation; loops and functions; graphics; statistical tests; and sample size calculation) and SAS (including importing data and different procedures)

Learning Objectives: At the end of the course, students will be able to achieve the learning objectives:
1. Use R and SAS to analyze data at the basic level.  
2. Use R and SAS to generate graphs.  
3. Use R and SAS to analyze data at an advanced level.

Text book: No text book required. Our notes will be self-sufficient.

Grading: Homework (10 homework, 60%), Midterm project (20%), Final project (20%)

Course schedule (tentative):
1. Introduction to R (2 weeks)  
   1.1 Overview of R  
   1.2 Data structure in R  
   1.3 Basic operations in R  
2. Loops, functions and graphics in R (3 weeks)  
   2.1 Loops and functions  
   2.2 Graphics  
   2.3 Character strings  
3. Statistical analysis in R (4 weeks)  
   3.1 Proportion tests and two sample tests (t-test and Wilcoxon test)  
   3.2 Chi-squared test and one way ANOVA  
   3.3 Regression and logistic regression  
   3.4 Sample size calculation  
4. Data analysis with SAS (4 weeks)  
   4.1 Overview of SAS  
   4.2 Reading, writing, and importing data in SAS  
   4.3 Graphics in SAS  
   4.4 PROC MEANS; PROC UNIVARIATE; PROC FREQ  
   4.5 PROC T-TEST; PROC ANOVA; PROC CORR; PROC REG; PROC LOGISTIC  
   4.6 Do Loops; SAS Macros
5. Project presentations (1 week)

**Special Needs Policy:** If you have any special needs related to your participation in this course (including identified visual impairment, hearing impairment, physical impairment, communication disorder, and/or specific learning disability that may influence your performance in this course), you should meet with the instructor to arrange for reasonable provisions to ensure an equitable opportunity to meet all the requirements of this course. At the discretion of the instructor, some accommodations may require prior approval by Disability Services.

**Academic Integrity Policy:** The University Rules, including the Student Code of Conduct, and other documented policies of the department, college, and university related to academic integrity will be enforced. Any violation of these regulations, including acts of plagiarism or cheating, will be dealt with on an individual basis according to the severity of the misconduct.

**Severe Weather Policy:** During periods of severe inclement weather, public emergency, or other crisis, the president or a designated cabinet officer may announce, through the University of Cincinnati electronic mail system and through the local news media, that some or all of the courses are concealed for part or all of a day.