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Fall 2017

BIOS 7534 - Data Management for Biostatistics

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Georgia Southern University
Jiann-Ping Hsu College of Public Health

BIOS 7534 – Data Management for Biostatistics
Fall 2016

Instructor: Dr. Robert Vogel

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Fax:

Website: Folio

Time:

Location:

Office Hours: Monday and Thursday 12:30-1:45 pm and by appointment

Prerequisites: none

Catalog Description: This course emphasizes data management and software applications using the SAS (Statistical Analysis System) software package. It will introduce the student to SAS codes for: inputting and outputting data, creating temporary and permanent data sets, creating formatted and labeled SAS data sets, merging and connecting SAS data sets, creating output using the TABULATE and REPORT procedures, debugging a SAS program that includes the TABULATE, REPORT and SQL procedures, using characteristic functions in SAS, using a random number generator, probability distributions, arrays, and date and time functions. Students will also write a simple and complex query using the SQL procedure; create, populate and modify a set of tables/views using the SQL procedure; and create a SAS program which includes one or more macros. This course will cover basic relational database design and descriptive statistics in SAS. Particular focus is placed on applications pertaining to public health and biomedical research. 4 credit hours.

Required Textbook: 1- SAS Certification Prep Guide Base Programming: SAS Publishing ISBN# 1-59047-335-3

Other Resources: 1) Introduction to SAS – Vogel (in folio)
2) SAS Certification Prep Guide Advanced Programming for SAS.

- 3.) Cody's collection of Popular SAS Programming Tasks
- 4.) Gupta Sunil. 2013. Quick Results with the Output Delivery System. Cary, NC: SAS Institute Inc.
- 5) Delwiche, Lora D. and Slaughter, Susan J. 2010. The Little SAS Book: a primer Third Edition. Cary, NC: SAS Institute Inc.
- 6.) SAS Macro Programming Made Easy

MPH Core Student Learning Outcomes

1. Demonstrate proficiency and effectiveness in the communication of core public health principles and practices, both oral and written.
2. Demonstrate proficiency in the integration of the core public health disciplines (Biostatistics, Epidemiology, Environmental Health, Health Policy/Management, and Social/Behavioral Science) in practice and research.
3. Demonstrate proficiency in problem solving, critical thinking, and public health leadership

MPH Biostatistics Student Learning Outcomes (BIOS)

1. Construct a public health and biomedical research question from ideas, conditions, and events that exist in a rural and urban community, region, state, and nation using critical thinking skills.
2. Design an experiment, survey or clinical trial pertaining to a public health and biomedical research question in order to collect the data needed to meet objectives of public health research.
3. Select appropriate statistical tools, methodological alternatives and graphical descriptives to analyze and summarize public health and biomedical data
4. Interpret results of biostatistical analyses so that valid and reliable conclusions regarding a public health and biomedical research question may be drawn from the analyses.
5. Communicate biostatistical principles and concepts to lay and professional audiences through both oral and written communication.

MPH Concentration Competencies in Biostatistics

1. Provide the biostatistical the components of the design of a public health or biomedical experiment by: clarifying the research objectives or questions; determining data and endpoints to be collected appropriate for the objectives; translating the objectives into biostatistical questions via hypothesis testing or confidence interval frameworks; determining the appropriate sample size; and writing the statistical analysis section of the experiment.

2. Apply appropriate statistical analysis methods using SAS to analyze both categorical and quantitative data.
3. Develop written and oral reports to communicate effectively to research investigators pivotal aspects of a study, including its design, objectives, data, analysis methods, results, and conclusions ensuring that results and conclusions are valid and reliable and address the research objectives.
4. Create a collaborative environment for working on written and oral reports and developing critical thinking skills.
5. Describe key concepts and theory underlying biostatistical methodology used in probability and inferential, analytical, and descriptive statistics

Performance-Based Objectives Linked to Course Activities (Note: Activities Described in Next Section)

1. Students will create SAS codes for inputting and outputting data into permanent and temporary data sets that are labeled and formatted.
2. Students will write SAS codes to merge and connect data sets and create new variables from existing ones with efficient code utilizing arrays and loops.
3. Students will create output using the TABULATE and REPORT procedures.

Assessment of Student Learning

Activity 1: A series of programming tasks will measure objective 1 progressively throughout the semester.

Activity 2: A real data project will be used to measure objective 2.

Activity 3: A final examination will be used to assess all three objectives.

Overview of the content to be covered during the semester:

<i>Week</i>	<i>Topic</i>	<i>Readings</i>	<i>Homework Assignment</i>
1	Basics (Learning Objectives: 1, 2)	Chapter 1 and 2 SAS Certification Guide	TBA
2	Errors, debugging and list reports (Learning Objectives: 13, 14)	Chapter 3 and 4 SAS Certification Guide	TBA
3	SAS DATA step (Learning Objectives: 1, 2)	Chapter 5 and 6 SAS Certification Guide	TBA
4	Creating user defined formats (Learning Objectives: 3)	Chapter 7 SAS Certification Guide	TBA
5	Enhanced List and Summary Reports (Learning Objectives: 11,15,12, 14)	Chapter 8 SAS Certification Guide	TBA
6	Descriptive Statistics and HTML output (Learning Objectives: 8, 9, 10)	Chapter 9 and 10 SAS Certification Guide, ODS Examples Zip file	TBA
7-8	Creating and managing variables (Learning Objectives: 4)	Chapter 11 SAS Certification Guide and code from CD	TBA
9	Reading SAS data sets (Learning Objectives: 4)	Chapter 12 SAS Certification Guide	TBA
10	Combining SAS data sets and Transforming data (Learning Objectives: 4)	Chapter 13 and Chapter 14 SAS Certification Guide	TBA
11	Do loops (Learning Objectives: 1, 2)	Chapter 15 SAS Certification Guide	TBA
12	Arrays (Learning Objectives: 6)	Chapter 16 SAS Certification Guide	TBA
13-14	Reading various data forms (Learning Objectives: 1, 2, 3, 5, 7)	Chapters 17, 18, 19 20, 21 and 22 SAS Certification Guide	TBA

15	If time permits learn about Macro Programming (Learning objectives 12)	Material will be given	TBA
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Instructional Methods:

Class meetings will be a combination of lecture, class discussion, and computer software demonstration. Written homework assignments and examinations constitute the basis of student evaluation.

Exam Schedule and Final Exam:

Mid Term Exam: TBA

Final Examination:

Grading: Weighting of assignments for purposes of grading will be as follows:

Programming Assignments	100 points 40%
Mid Term Exam	100 points 30%
Final Exam (final project)	100 points 30%
Total Possible Points	<hr/> 300 points 100% <hr/>

The following point scale will be utilized in grading:

- 300-to- 270 points (90%) A
- 270-to-240 points (80%) B
- 240-to-210 points (70%) C
- 210-to-180 points (60%) D

A cumulative total of 180 points or less will be considered as failing.

Your grades **will not** be posted. All exams and assignments will be graded and returned promptly so that students may accurately calculate their grades at any point in time during the semester.

There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such circumstances, and/or if you need additional time to satisfactorily complete any course requirement, please consult with the instructor within a reasonable amount of time. *Nota Bene:* Extensions are not guaranteed and will be granted solely at the discretion of the instructor.

NO EXTRA CREDIT PROJECTS WILL BE ASSIGNED!

Academic Misconduct: As a student registered at this University, it is expected that you will adhere to only the strictest standards of conduct. It is recommended that you review the latest edition of the *Student Conduct Code* book, as well as the latest *Undergraduate & Graduate Catalog* to familiarize yourself with the University's policies in this regard. Your continued enrollment in this course is an implied contract between you and the instructor on this issue; from this point forward, it is assumed that you will conduct yourself appropriately.

Academic integrity relates to the appropriate use of intellectual property. The syllabus, lecture notes, and all materials presented and/or distributed during this course are protected by copyright law. Students are authorized to take notes in class, but that authorization extends only to making one set of notes for personal (and no other) use. As such, students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without the express written permission of the instructor.

Academic Handbook: Students are expected to abide by the Academic Handbook, located at <http://students.georgiasouthern.edu/sta/guide/>. Your failure to comply with any part of this Handbook may be a violation and thus, you may receive an F in the course and/or be referred for disciplinary action.

University Calendar for the Semester:

The University Calendar is located with the semester schedule, and can be found at:
<http://www.collegesource.org/displayinfo/catalink.asp>.

Attendance Policy: Federal regulations require attendance be verified prior to distribution of financial aid allotments. Attendance will not be recorded after this initial period.

One Final Note: The contents of this syllabus are as complete and accurate as possible. The instructor reserves the right to make any changes necessary to the syllabus and course material. The instructor will make every effort to inform students of changes as they occur. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course.