

GEORGIA SOUTHERN UNIVERSITY
Jiann-Ping Hsu College of Public Health
BIOS 7534—Data Management for Biostatistics
Fall, 2009 (Online Course)

<u>Instructor:</u>	Dr. Hani M. Samawi
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<u>Office Hours:</u>	Thursday – 4:00 pm-to-6:00 pm Monday and Wednesday – 2:00 pm-to-4:00 pm Other times by appointment
<u>Web Page:</u>	Yes
<u>Class Meets:</u>	Thursday 6:30 pm-to-9:15 pm Hollis Building 1123

-- Course schedules can be found at: <http://www.collegesource.org/displayinfo/catalink.asp> --

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. 3 credit hours.

Required Textbook: 1- SAS Certification Prep Guide Base Programming: SAS Publishing
2- Vogel, RL. Whitworth, R. Introduction to SAS. (Distributed in class). + Hani Samawi Notes.

Other Resources:

- 1) SAS Institute. 1999. SAS Guide to Report Writing: Examples.
- 2) Cary, NC: SAS Institute Inc. 1- Cody, Ron. 2004. SAS Functions by Example. Cary, NC: SAS Institute Inc.
- 3) Lafler, Kirk Paul. 2004. Proc SQL: Beyond the Basics Using SAS. Cary, NC: SAS Institute Inc.
- 4) Gupta Sunil. 2003. Quick Results with the Output Delivery System. Cary, NC: SAS Institute Inc.
- 5) Delwiche, Lora D. and Slaughter, Susan J. 2004. The Little SAS Book: a primer Third Edition. Cary, NC: SAS Institute Inc.

M.P.H. Biostatistics Concentration Competencies:

Upon graduation a student with an M.P.H. in Biostatistics should be able to:

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. Identify objectives of a public health and biomedical research question;
3. Express objectives in the appropriate biostatistical framework such as hypothesis testing, estimation, and prediction;
4. Evaluate objectives of a public health research question to ensure the appropriate type of data is collected for analysis;
5. Design an experiment or survey pertaining to a public health and biomedical research question in order to collect the data needed to meet objectives of public health research;
6. Apply appropriate statistical tools and software in order to analyze data;
7. Demonstrate use of Statistical Analysis System (SAS) to input, manage, merge, export, and conduct analysis on public health and biomedical data;
8. Analyze data using appropriate categorical analysis techniques to obtain valid and reliable results;
9. Analyze quantitative data using appropriate biostatistical methods such as simple and multiple regression and clinical trial methodology;
10. Develop a protocol for conducting a clinical trial;

11. Describe key concepts and theory underlying biostatistical methodology used in probability and inferential, analytical, and descriptive statistics;
12. 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;
13. 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;
14. Create a collaborative environment for working on written and oral reports and developing critical thinking skills.

Course Objectives: At the completion of this course the student will be able to:

1. Create SAS codes for inputting and outputting data.
(competencies 7, 11, 13)
2. Create temporary and permanent data sets.
(competencies 7, 11, 13)
3. Create labeled and formatted SAS data sets.
(competencies 7, 11, 13)
4. Demonstrate use of SAS to merge and connect data sets.
(competencies 7, 11, 13)
5. Demonstrate use of the characteristic function in SAS.
(competencies 7, 11, 13)
6. Apply arrays in SAS.
(competencies 7, 11, 13)
7. Apply date, time, zip code, and state functions in SAS.
(competencies 7, 11, 13)
8. Apply mathematical functions in SAS.
(competencies 7, 11, 13)
9. Demonstrate use of SAS for conducting descriptive statistics.
(competencies 7, 11, 13)
10. Apply probability and random number functions, including PROC PLAN, in SAS.

(competencies 7, 11, 13)

11. Create output using the TABULATE and REPORT procedures.
(competencies 7, 11, 13)
12. Describe basic relational database design.
(competencies 7, 11, 13)
13. Demonstrate skills for debugging a SAS program that includes the TABULATE, REPORT and SQL procedures.
(competencies 7, 11, 13)
14. Construct a simple and complex query using PROC SQL.
(competencies 7, 11, 13)
15. Create, populate and modify a set of tables/views using PROC SQL. (competencies 7, 11, 13)
16. Create a SAS program which includes one or more macros.
(competencies 7, 11, 13)
17. Create a collaborative environment for working on written and oral reports and developing critical thinking skills.
(competencies 13, 14)

Overview of the content to be covered during the semester:

Week	Topic	Readings	Assignment
1	Module 1-Basic Concepts (Learning Objectives: 1, 2)	Chapter 1 and 2 SAS Certification Guide and Hani-Notes	M1-Assignment-Basic Concepts
2	Module 2-Errors editing and debugging SAS programs and Creating list reports (Learning Objectives: 13, 14, 15)	Chapter 3 and 4 SAS Certification Guide and Hani-notes	M2-Assignment- Errors, debugging and list reports
3	Module 3-SAS DATA step (Learning Objectives: 1, 2)	Chapter 5 and 6 SAS Certification Guide	M3-Assignment- SAS Data Step
4	Module 4-Creating user defined formats (Learning Objectives: 3)	Chapter 7 SAS Certification Guide and selected and Hani-notes	M4-Assignment- Creating user defined formats
5	Module 5-Enhanced List and Summary Reports (Learning Objectives: 11,15,12, 14,15, 16)	Chapter 8 SAS Certification and Hani-notes	M5-Assignment- Enhanced List and Summary Reports
6	Module 6-Descriptive Statistics and HTML output (Learning Objectives: 8, 9, 10)	Chapter 9 and 10 SAS Certification Guide and Hani-notes	M6- Assignment- Descriptive Statistics and HTML output
7-8	Module 7-Creating and managing variables (Learning Objectives: 4)	Chapter 11 SAS Certification Guide and Hani-notes	M7- Assignment- Creating and managing variables
9	Module 8- Reading SAS data sets (Learning Objectives: 4)	Chapter 12 SAS Certification Guide and Hani-notes	M8- Assignment- Reading SAS data sets
10	Module 9-Combining SAS data sets and Transforming data (Learning Objectives: 4)	Chapter 13 and Chapter 14 SAS Certification Guide and Hani-notes	M9- Assignment- Combining SAS data sets and Transforming data
11	Module 10-Do loops (Learning Objectives: 1, 2)	Chapter 15 SAS Certification Guide and Hani-notes	M10- Assignment- Do loops

12	Module 11-Arrays (Learning Objectives: 6)	Chapter 16 SAS Certification Guide and Hani-notes	M11- Assignment- Arrays
13-16	Module 12-Reading various data forms (Learning Objectives: 1, 2, 3, 5, 7)	Chapters 17, 18, 19 20, 21 and 22 SAS Certification Guide and Hani-Notes	M12- Assignment- Reading various data forms

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:

Midterm Examination: October 22, 2009

Final Examination: December 10, 2009; 6:30 pm-9:15 pm

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

Midterm Exam (assesses learning objectives 1-7)	120 points (30%)
Final Exam (final project) (assesses learning objectives 8-16)	160 points (40%)
Assignments & quizzes (assesses learning objectives 1-17)	120 points (30%)
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Total Possible Points	400 points (100%)
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The following point scale will be utilized in grading:

360-to-400 points (90%) A

320-to-359 points (80%) B

280-to-319 points (70%) C

240-to-279 points (60%) D

A cumulative total of 239 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.