PH 7525 – Introduction to Data & Statistical Packages

Course Reference #: 18254
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Scott R. Weaver, Ph.D.
Division of Epidemiology & Biostatistics

Course Basics	**Class Day/Time:**	Wednesday (8/27 – 12/3, <u>except 11/26</u>): 4:30pm - 7:00pm Wednesday, 12/10, 4:15pm – 6:45pm (**Final**)
	Class Location:	34 Peachtree, Room 504
	Prerequisite(s):	Principles of Epidemiology (PH 7011) or STAT 7010 (Biostatistics)
	Required Course Text	Cody, Ron (2007)*. Learning SAS® by Example: A Programmer's Guide*. 2013. Cary, NC: SAS Institute Inc. (Available through GSU bookstore; SAS Books, 20% discount; or GSU Books 24*7 at http://www.books24x7.com/marc.asp?bookid=23074 **Free!**)
	Optional Course Text	Delwiche, Lora D, and Susan J. Slaughter (2012)*. The Little SAS® Book: A Primer, Fifth Edition*. Cary, NC: SAS Institute Inc.
	Required Software	We will primarily focus on the use of SAS. Since this course emphasizes the use of statistical software for conducting analyses, you need to keep in mind that you will be required to conduct analyses outside of the designated class time. Therefore, you will need access to a computer with SAS 9.4 for practice and assignments. SAS is available to students via download and installation on personal computers (Windows) and on most GSU lab and office computers. The SPH Biostatistics Computer Lab at 25 Park Place (12B) has SAS installed and is open to students during most regular business hours. SAS University Edition (free) is another option that Linux and Mac users may wish to consider.

Faculty Accessibility	**Instructor of Record:**	Scott R. Weaver, Ph.D.
	Office Location:	Urban Life Bldg., Room 845
	Phone Number:	404-413-1349
	Email:	srweaver@gsu.edu
	Office Hours:	Office hours by appointment

I. Course Description:

This course is designed for students who are in the process of analyzing data for their thesis or dissertation. Through this course, the student will become and adept user of SAS, a statistical package widely used within public health and other fields. In this course, students will learn base programming of SAS for reading data, processing and transforming data, descriptive analysis, and visualization data. (Depending on time and student interest, a brief introduction to the SPSS statistical package will also be given.) Students will learn how to document research work and make the work replicable. This course will not teach statistics, but will enable students to become familiar with a powerful and widely-used program for data management and analysis.

II. Course Objectives / Competency / Assessment of Student Learning:

This course is designed to support students in acquiring competence in the following one area, as indicated in the School of Public Health Graduate Student Handbook (see *MPH Core Competencies*).

- Use statistical software, perform appropriate statistical analyses based on the research questions, research design, and appropriateness or tenability of statistical assumptions. (MPH Core Competency #2)

Course Objectives	Program Competency*	Assessment Method(s)
Be able to use SAS to read data from external files	**BSTP #8**	All HW Assignments & Data/Analysis Project
Be able to use SAS to effectively prepare and manage data for analysis	**BSTP #8**	All HW Assignments & Data/Analysis Project
Be able to use SAS to obtain descriptive statistics for summarizing data	**BSTP #7, BSTP #8, BSTP #10**	HW Assignments #5-6 & Data/Analysis Project
Be able to use SAS to obtain visual summaries of data (e.g., graphs)	**BSTP #8**	HW Assignment #7 & Data/Analysis Project

*Biostatistics Program Competencies
- Perform statistical analyses including correlation, simple linear regression, multivariable linear regression, logistic regression and analysis of variance. (BSTP #7)
- Utilize a software package for data management, statistical analysis and data presentation. (BSTP #8)
- Interpret results of statistical analyses and use these results to make relevant inferences. (BSTP #10)

IV. Course Assignments and Requirements

This course assumes substantial and informed student participation. At a *minimum*, being informed requires class attendance, completion of assigned readings and homework, and at-home practice with SAS.

Course requirements will contribute to grade as follows:

8 HW Assignments	80%
Data/Analysis Project	20%

Homework Assignments:

Students will be expected to complete assignment/problem sets. **Eight** assignments will be assigned with due dates. Instructor also reserves the right to randomly choose portions of assignments for grading (e.g., instructor may choose to review only odd or only even problems for grading). All assignments should be submitted by the date and time due via Desire2Learn. For some assignments, multiple files may need to be submitted. All portions of the assignment must be submitted by the due date/time in order to be considered on-time.

Data/Analysis Project:

The data/analysis project will provide students with an opportunity to obtain experience applying SAS programming skills learning in this course to a data set of interest to the student. Students will work individually on a project focusing on finding a data set of interest, performing quality control and data integrity checks of the data, performing recodes as necessary. Students will work individually on a project focusing on finding a data set of interest, determining and implementing appropriate graphical methods for presenting the data, using appropriate statistical tools to analyze the data, generating appropriate SAS code with annotations, and summarizing the results of their work. There will be a written report. Dues dates for portions of the project will be provided. Project details (including grading rubric) will be provided and discussed in the class.

Attendance:
Class attendance and thoughtful participation are important and will be reflected in the final grade. Please notify the instructor of an absence before the class and be prepared to provide documentation supporting the absence if requested. The instructor will periodically take attendance, and each unapproved absences beyond the first absence will result in a .5% point reduction from the student's final grade. Please note that attendance requires being on time for the class and remaining in class for the entire duration of the class. If extenuating circumstances require a late arrival or early departure, please inform the instructor via email.

V. Grading Policy

Grading Scale (%):

94 – 100	A
90 – 93	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
77 – 79	C+
73 – 76	C
70 – 72	C-
60 – 69	D
Below 60	F

SAS Base Programmer Certification:
SAS has a certification programming for SAS users. Among the certifications available is the SAS Certified Base Programming for SAS 9 Credential. Much of this course will cover topics relevant to SAS Base Programming Certification. Any student who is not certified as of the first day of the course successfully obtains the SAS Certified Base Programmer for SAS 9 Credential and demonstrates proof of certification to the instructor by December 10th will be given an A in this course. This will override any grades on assignments or adjustment for non-attendance. Note that this is entirely optional and that students are entirely responsible for all costs and requirements associated with sitting for the SAS Certified Base Programming exam. If you considering this option, I would strongly advise completing all course assignments, readings, and attending class until the point you have obtained certification.

Withdrawals: A student who withdrawals at any time up to the mid-point of the quarter will be assigned a <u>W</u> or <u>WF</u> depending upon whether he/she is doing satisfactory work at the time of withdrawal. An average grade of D or F at the time of withdrawal will be assigned a grade of WF. After the mid-point of the quarter, the Registrar's Office will assign an automatic WF to any student who withdraws from the course without a hardship withdrawal. If a student receives permission to withdraw under hardship, the Instructor will assign a W or WF grade depending upon the student's work up to the point of time that the student withdrew.

The following is the formal policy at Georgia State University:

Effective Fall 2001, Instructors must on a date after the mid-point of the course to be set by the Provost (or her designee),

1. give a WF to all those students who are on their rolls but no longer taking the class and
2. report the last day the student attended or turned in an assignment.

Students who are withdrawn may petition the department chair for reinstatement into their classes.

Incompletes: A student will be given the grade <u>I</u> only if nonacademic circumstances beyond the student's control prevent the student from completing a small segment of the course—e.g., the final project. For a student to receive the grade of <u>I</u>, he/she must be doing satisfactory work (an average grade of B or better) up to the point that he/she could not continue. Arrangements must be made with Instructor to remove the incomplete grade within one quarter.

VI. Attendance Policy

Attendance is expected and will be reflected in part in the final grade as reflected above.

VII. Late Assignments

Assignments submitted late but within 24 hours of the deadline will be assessed a 10 percentage point penalty. Assignments submitted more than 24 hours after the deadline will receive a grade of 0.

VIII. Syllabus Deviation Policy

The course syllabus and schedule of topics provide a general plan for the course; deviations may be necessary. Additional or substitute reading materials may be required and made available to students via handout or other means.

IX. Policy on Academic Honesty

All students at this University are expected to engage in academic pursuits on their own with complete honesty and integrity. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The complete Academic Honesty policy is located in the GSU Graduate Catalog, http://catalog.gsu.edu/graduate20142015/university-academic-regulations/#academic-honesty. Students and faculty are expected to review and conform to the university's policy on academic honesty.

X. Classroom Accommodations Policy

Students who wish to request accommodation for a disability may do so by registering with the GSU Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which an accommodation is sought. The Office of Disability Services is located in the GSU Student Center, Suite 230.

XI. Course Evaluations Statement

Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing this course, please take time to fill out the online course evaluation

XII. Additional Policies and Statements

Communication
Students should check Desire2Learn at least every other day, especially before driving or riding to GSU for this course. The syllabus, any changes to the syllabus, course announcements, lecture slides, additional readings, assignments, and grades will be posted to Desire2Learn. Should you have any questions about the course or its requirements, please ask your question during class or contact the Instructor via **GSU email** (srweaver@gsu.edu) with **PH 7525, your name, and a relevant subject** in the subject line. Responses to emails without this information or sent through the Desire2Learn system may be delayed. Students also may make an appointment to meet with the Instructor on class concerns. Should you wish to contact the Instructor about your grades, please address them in writing or in person. Please understand that FERPA limits the extent to which instructors can communicate with students about grades via email.

Syllabus
The course syllabus and schedule of topics provide a general plan for the course; deviations may be necessary. Additional or substitute reading materials may be required and made available to students via handout or other means. In addition, as noted in the "Course Requirements" section above, students are expected to independently access and be familiar with health care issues and topics as presented in various media.

Copyright Policy
"For the purpose of copyright, students must adhere to the following rules:
1) Materials in the course reserves may only be accessed by a passcode or password by students enrolled in that course, and only for the semester of course enrollment
2) Students may not distribute copies of course reserves materials to other students

Grade Point Average Requirements
An overall grade point average (GPA) of 3.0 or better must be earned to receive the MPH degree. All core courses must be completed with a grade of B or better, and no more than six semester hours of grades less than B will be accepted for the degree. No grade below a C will be accepted toward the degree. Please refer to the School's academic standing policy on Academic Warning and Suspension described in the School of Public Health section of the Graduate Catalog:
http://www2.gsu.edu/~catalogs/2012-2013/graduate/

Important Websites
Links to course relevant resources and information will be posted on Desire2Learn.

Courtesy/Appropriate Class Behavior

Students who exhibit behaviors that are considered to obstruct or disrupt this class or its learning activities will be considered under the Board of Regents Policy on Disruptive Behavior. Behaviors which are considered to be inappropriate in this classroom include sleeping, coming in late (more than 5 minutes), interrupting others, talking out of turn, inappropriate behavior in group interactions, verbal behavior that is disrespectful of other students or the teacher, or that may be disruptive. In addition, it is considered unacceptable behavior to use classroom computers for any purpose (including checking email) not directly relevant to this class. Students who exhibit such behavior may be subject to disciplinary procedures as outlined in the GSU general catalogue. Please turn off all cell phones during class time!

Course schedule, topics and readings:

1. August 27
Topic(s): Overview of course/Syllabus/Assignments and grades/Communication/Desire2Learn
Introductions
Introduction to SAS
Readings: Cody, Ch. 1-2

2. September 3
Topic(s): Reading Data from External Files
Readings: Cody, Ch. 3-4

3. September 10
Topic(s): Reading Data from External Files (cont.)
Formats and Labels
Readings: Cody, Ch. 5-6
HW Assignment #1 due September 9 (4:00 pm) via D2L

4. September 17
Topic(s): Performing Conditional Processing
Iterative Processing
Readings: Cody, Ch. 7 & 8

5. September 24
Topic(s): Working with Dates
Subsetting and Combining SAS Data Sets
Readings: Cody, Ch. 9-10
HW Assignment #2 due September 23 (4:00 pm) via D2L

6. October 1
Topic(s): Numeric and Character Functions
Readings: Cody, Ch. 11-12
HW Assignment #3 due September 30 (4:00 pm) via D2L

7. October 8
Topic(s): Working with Arrays
Readings: Cody, Ch. 13
HW Assignment #4 due October 7 (4:00 pm) via D2L

8. October 15
Topic(s):
Displaying Data
SAS Debugging
Catch-up
Readings: Cody, Ch. 15; Little SAS Book, Ch. 11 (D2L)
HW Assignment #5 due October 14 (4:00 pm) via D2L

9. October 22
Topic(s): Summarizing Data with PROC MEANS and PROC FREQ
Readings: Cody, Ch. 16-17

10. October 29
Topic(s): Creating Tabular Reports
Readings: Cody, Ch. 18
HW Assignment #5 due October 28 (4:00 pm) via D2L

11. November 5
Topic(s): Visualizing Data with the Output Delivery System (ODS)
Readings: Cody, Ch. 19-20
HW Assignment #6 due November 4 (4:00 pm) via D2L

12. November 12
Topic(s): Selected Advanced Topics in SAS Programming
Readings: Cody, Ch. 21-22
HW Assignment #7 due December 11 (4:00 pm) via D2L

13. November 19
Topic(s): Selected Advanced Topics in SAS Programming
Reading: Cody, Ch. 23-24

No Class – November 26 (Thanksgiving)

14. December 3
Topic(s): Introduction to SPSS
Reading: Fields Ch. 3 (D2L)
HW Assignment #8 due December 2 (4:00 pm) via D2L

15. December 10 (4:15pm – 6:45)
Topic(s): TBD
Data/Analysis Project due <u>December 11</u> (<u>12:00 pm</u>) via D2L