



## School of Public Health

### CERTIFICATE IN EPIDEMIOLOGY AND BIostatISTICS

PBHL 703

### DESIGN AND ANALYSIS OF EPIDEMIOLOGICAL STUDIES

3 credit hours

**Instructor:** Nicole Blackman, PhD

**Email:** [Nicole.Blackman@gsk.com](mailto:Nicole.Blackman@gsk.com)

### COURSE DESCRIPTION

This third course in the epidemiology certificate series is very different from 701 and 702. It is designed to give the student an independent and in-depth experience in many of the processes of conducting an epidemiologic study, including conceiving hypotheses, literature review, writing a proposal, obtaining informed consent, planning data collection, managing data in SPSS, conducting logistic regression analyses, interpreting data, and writing a final report.

There is no final exam. The research report is, in total, 85% of your grade. The three graded exercises (weeks 1, 9, and 10) each comprise 5% of your grade.

Each week there will be exercises, written assignments, as well as readings. Some of these readings will be review of materials from 701 and 702, in preparation for applying the principles and skills you learned and practiced to an actual research experience.

**Due Dates and Grading:** Approximately one week will be allowed for the graded written assignments. The exact due dates will be communicated by the instruction. Grades for assignments received after the due date will be decreased, to the extent determined by the instructor's discretion.

The full research report will be due to Drexel SPH staff assistant (email to be provided) by Monday December 5. The staff assistant will immediately print out the reports and transmit them, plus a disk with an electronic version, to your instructor. Any reports that are not received by December 5 will not be given a grade during December 2005. In addition to receiving an incomplete grade, the eventual grade for final reports received late will also be graded lower to an extent determined by the instructor.

**Research Dataset:** You will be given a dataset, already in SPSS, with all the data you need to conduct the analyses. It is derived from a real-world population survey. You will choose among a short list of potential research topics relating to disabilities, chronic diseases, and other factors that could affect these.

This course also includes a few additional basic topics in epidemiology/biostatistics that were not included in 701 and 702. For most of the course, the students have a great of discretion about how much time they will devote to the project, and how to use that time.

We expect that the approximate number of hours of work per week for this course to be about the same as for the previous courses (averaging about nine per week). However, it is anticipated that some students will be able to complete the requirements more quickly than others, that some will choose to spend more time than necessary for minimum satisfactory completion, and that some will find this course much more time-consuming (or perhaps less) than the previous courses in the series.

Due to the nature of this course, it is not primarily based on textbook reading. The materials that have been chosen as readings and resources will hopefully provide the necessary background and guidance for the students' assignments.

Many of the readings are PowerPoint presentations or other outline-type information downloaded or accessible from the Internet. There is very little newly written lecture material. Many weeks will require or encourage students to review specific topics from courses 701 and 702, i.e. the topics that will be specifically utilized during that week's writing or SPSS exercise assignment.

The exception to textbook requirement is the strong recommendation that students obtain a good primer or manual for SPSS version 13, particularly one that includes material on Logistic Regression for SPSS 13. Students may also use material they already have from other sources.

Although learning to use key operations of SPSS are required for this course, many other SPSS functions will not be required, including the methods of getting data into SPSS, converting data to other programs, and various important functions that students may need to learn at a later date in their work but which are not pertinent to their research project and report in this course.

MAJOR TOPICS and TYPES of ASSIGNMENTS for the ten weeks of COURSE 703.

Week and Percent of Grade	Topic	Assignments
1 Exercise 5%	Comparison of rates in two populations Orientation to research project	Reading and exercises Reading on field study management issues Review reading on case control study principles
2 Lit Review 10%	Literature review, Generating research questions and hypotheses	Select research topic. Write literature review. Generate hypothesis.
3 Proposal sections 10%	Research Proposal	Reading on proposal generation. Review logistic regression Write research protocol section of research proposal
4 Combined Assignments: 10%	Protection of Human Subjects	Take on-line NIH certification course. Read further material on human protection and informed consent. Write consent form and human subject protection section of proposal
5 Sampling protocol: 5% C&O variables exercise 1% SPSS Assignments: 4%	Variable identification, measurement Conceptual and Operational Variables  Validity and Reliability  Sampling principles and strategies  SPSS exercises: frequency distributions	Readings and brief exercises on conceptual vs operational variables Readings and brief writing on Validity & Reliability  Reading on sampling. Write sampling protocol section of proposal.  Write preliminary section of discussion on V&R issues for key variables  SPSS: Submit frequency distributions of key variables
6 SPSS assignments: 4% Statistical power exercise 1%	New variable generation and recoding  Logistic regression model preparation  Evaluation of potential confounding  Statistical power for case control studies	Using SPSS, submit variables before and after recoding that will and that may be used in the logistic regression analyses. Submit contingency tables and chi squares to select potential confounders.  Reading review of hypothesis testing and statistical power.  Brief exercise on statistical power for case control studies.
7 SPSS assignments and draft of Results section: 5%	<b>Data management:</b>  Logistic regression analyses	<b>Reading on data management.</b>  SPSS reading on logistic regression analyses and interpretation of output  Generate and submit preliminary results tables.
8 Written sections: 10%	Interpretation of data. Critique of strengths and limitations of epidemiologic studies and reports.	Revise/complete the Results section, Write Discussion section of the research report.
9 Submission of final research report 25 %	Infectious disease epidemiology Part I Food-borne outbreaks (exercise due in Week 10)s	Readings on infectious diseases, particularly food-borne outbreaks  Submit final research report
10 Two Graded exercises: 10% (5% each)	Infectious disease epidemiology Part II Investigations and current issues	<b>Additional readings and exercises on investigations of infectious disease outbreaks.</b>