EPID 715
Theory and Quantitative Methods in Epidemiology
2016 Syllabus

DESCRIPTION

An in-depth treatment of key methodologic topics in epidemiologic research, including problem conceptualization, study design, research conduct, data analysis and interpretation.

PREREQUISITES

EPID 705
EPID 710 (or approved equivalent)

COREQUISITES

BIOS 545 (or approved equivalent)

INSTRUCTIONAL TEAM

Instructor
Charles Poole
2401A McGavran-Greenberg
Email: cpoole@unc.edu
Phone: 919-918-3808
Office hours: Mon 1:00pm – 2:00pm (2401A MC)
Wed 9:00am – 10:00am (1305 MC or 2401A MC)
Fri 9:00am – 10:00am (2401A MC)
or by appointment

Teaching assistants
Suzanne Landi (slandi@email.unc.edu)
Kathleen McClain (kmccla@live.unc.edu)
Kate Rucinski (krucinsk@live.unc.edu)
Marie Stoner (stonerm@email.unc.edu)

REQUIRED TEXT

Rothman KJ, Greenland S, Lash TL. *Modern Epidemiology.* Third edition. Philadelphia: Lippincott Williams & Wilkins, 2008.

OUTCOME MEASURES

Class participation	10%
Exercises	4 @ 10%
Quizzes	5 @ 10%

GRADES

<60.0	F
60.0 – 74.9	L
75.0 – 89.9	P
≥90.0	H

SCHEDULE

Class meets 10:10 AM – 12:05 PM, MC 1305, on the following dates:

Monday	Event	Wednesday	Event
Jan 11		Jan 13	
Jan 18	**No class**	Jan 20	
Jan 25		Jan 27	Quiz 1
Feb 1	Exercise 1 posted	Feb 3	
Feb 8	Exercise 1 due	Feb 10	
Feb 15		Feb 17	Quiz 2
Feb 22	Exercise 2 posted	Feb 24	
Feb 29	Excercise 2 due	Mar 4	
Mar 7		Mar 9	Quiz 3
Mar 14	**No class**	**Mar 16**	**No class**
Mar 21		Mar 23	
Mar 28	Exercise 3 posted	Mar 30	
Apr 4	Exercise 3 due	Apr 6	Quiz 4
Apr 11		Apr 13	
Apr 18	Exercise 4 posted	Apr 20	
Apr 25	Exercise 4 due	Apr 27	Quiz 5

HONOR CODE

University policy requires all students to familiarize themselves with all provisions of the Instrument of Student Governance. The expression, "unauthorized assistance," in the descriptions of the graded material below is a key term in the Instrument.

The following links provide all the needed information: http://honor.unc.edu/ and

http://instrument.unc.edu/. These links are also provided on the course web site.

Appendix A of the Instrument states that each student is expected to "[s]ign a pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work." We abide by this requirement in EPID 715. Submitting an online quiz is tantamount to signing the pledge. The instructor reserves the right to deduct points without warning if the pledge is not written and signed on each written, graded assignment, whether or not a reminder is given.

CLASS ATTENDANCE

Attendance is not taken but is highly recommended. No one who has missed more than an session has ever done well in this course. If you will have to miss a class, or had to miss one, please let one of the teaching assistants know and give the reason.

CLASS PARTICIPATION

Selected lecture slides contain problems and questions to aid your preparation for class. It is a requirement to prepare this material before each class. There's no penalty for getting anything wrong on the class participation problems and questions. Being unprepared by not having tried to do them ahead of time may result in deductions from this component of the course grade.

There's no "unauthorized assistance," no restrictions on whom or what you may consult, in preparing the class participation material. You're encouraged to work together on these problems and to consult the teaching assistants, instructor or anyone else for clarification or other assistance.

EXERCISES

Each take-home exercise will be posted on the course web site approximately a week before it's due. An announcement will be sent when each one is posted. The exercises are due to the teaching assistants before class on the designated days. The teaching assistants will let you know how to submit the exercises and in what format (e.g., electronic, paper, etc.). The late penalty is 15 points for each day or fraction thereof.

Please make your answers legible. Use a word processor if necessary. If you're given instructions, please follow them. Otherwise, use your best judgment (e.g., on rounding). Show your work, whether instructed to or not. Use your best judgment about how much work to show. Picture yourself as a grader who wants to know how you arrived at your answers but doesn't want to be overwhelmed with detail.

Unless instructed otherwise, you're to complete the exercises on your own. "Unauthorized

assistance" thus consists of: (a) any communication with anyone other than the instructor and teaching assistants and (b) exams, exercises and answer keys from this course from previous years. (Years ago, the old course number was EPID 268.) You may discuss course content with classmates while working on an exercise, but not the specific questions on that exercise. Specific exercises may relax these specifications or tighten them, especially with regard to the use of spreadsheets, programming or computer applications.

QUIZZES

The quizzes will be on Sakai. They'll be open-book, but there won't be be enough time to look up very much. The quizzes will be modifications of the true/false and multiple choice formats, to be explained in class.

"Unauthorized assistance" consists of (a) any communication with anyone other than the instructor and teaching assistant, (b) use of any devices with which you can communicate with humans or other devices and (c) use of spreadsheets, programming or application. You may need a calculator. Inexpensive calculators without communication capabilities are readily obtained at the university book store and other retail outlets.

READINGS

You're responsible for all the material in the required textbook readings. The lectures are intended only to supplement this material and to clarify and amplify <u>some</u> of it. The topics may not be covered in the order listed below.

Required textbook readings by topic:

Populations and measures of disease frequency

32-49	Skim or skip "Other types of rates," 39-40.
100-110	
289-293	Skim or skip the material on variances and confidence intervals.

Effect measures

5-18
51-67
69-70
213-219
295-298
300-317

Effect-measure modification

71-83	You don't have to memorize the numbers of the 16 response types.

279-280
298-300

Confounding
49-50
67-70
129-134
168-169
183-209
258-278 You don't have to memorize expressions 15-7 through 15-22 or expression 15-24.
Skim or skip "Unconditional versus conditional analysis," 272-273.
Skim or skip "P-values for stratified person-time data" and "P-values for stratified pure count data," 277-278.
345-352 You don't have to memorize expressions 19-1 through 19-3.

Case-control and related designs
87-99
111-127

Information bias
137-147
352-361

Selection bias and missing data
128-129
134-137
138-140
219
362-363

Multiple bias analysis
363-380

Estimation and testing
151-169
219-221 Skim or skip "Approximate Statistics: The Score Method," 225-226.
Skim or skip "Approximate Statistics: The Likelihood Ratio Method," 229-230.
Skim or skip "Joint Confidence Regions," 235-236.
238-257 You don't have to memorize the variance formulas.
317-344

Design features affecting precision
148-150
169-182
283-288

Consecutive list of required textbook pages:
5-18
32-221
238-380

Additional readings:
All additional readings will be identified with PubMed identification numbers in the lecture slides. Most are optional but highly recommended. Some are illustrative research reports we'll use as examples, including extraction of data. In that sense, they're required.

EPISHEET

A Microsoft Excel workbook called *Episheet.xls* is posted on the course web site. We'll use it a lot. Please familiarize yourself with it, if you haven't already.

This spreadsheet program contains macros. To get it to work properly, you may need to relax the security settings on your operating system or your installation of Excel.