EPID 710, FUNDAMENTALS OF EPIDEMIOLOGY **Fall 2014**

Class time	T Th 11.00-12.15	
Class location	McGavran-Greenberg Hall 2301	
Labs	Variable.	
Instructors	Daniel Westreich	djw@unc.edu
	Wayne Rosamond	wayne_rosamond@unc.edu
TAs	Amy Huber	anhuber@live.unc.edu
	Ruth Link-Gelles	ruthlg@live.unc.edu
	Marissa Seamans	seamans@live.unc.edu
Office hours	starting August 25	
Instructor	TBD	McGavran-Greenberg Hall 2105C
TAs	Tuesday 9.00-10.00	Epidemiology student room
	Tuesday 12.30-1.30	Epidemiology student room
	Thursday 10.00-11.00	Epidemiology student room

Honor code Academic integrity is at the heart of Carolina and moreover at the heart of the scientific enterprise. We all are responsible for upholding the ideals of honor and integrity. The student-led Honor System is responsible for adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the honor system. Information, including your responsibilities as a student is outlined in the Instrument of Student Judicial Governance. Your full participation and observance of the Honor Code is expected. If you have any questions about this issue, you may talk with the Instructors or a TA. (Most language directly from http://studentconduct.unc.edu/faculty/honor-syllabus).

Grading Grades are based on four components: take-home exercises (24% of final grade); mid-term exam (24% of final grade); final exam (36% of final grade); and lab (16% of final grade). High pass will be given for final grade of 90.0 and above; pass for 70.0-89.9; low pass for 60.0-69.9; fail for <60.0.

Exercises The three exercises are to be completed independently, without help from any other students. Late policy: 50% of your final score is deducted for each day late. If you have a scheduling conflict which will prevent you from completing or turning in the assignment on time, talk to the Instructor one week before the assignment is due. Reasonable exceptions will be made for sicknesses and emergencies.

Labs Attendance in lab is required without prior authorization from your TA; active participation is expected. Labs are posted 1 week in advance; you are required to email your answers to lab questions to your TA by 9.45am the Monday of that lab session. (That is, Lab 2 is due at 9.45am on September 8). You may work in groups and consult whatever guides you wish to complete the labs; however, your words must be your own (do not copy answers word-for-word from each other). Lab grade will be determined as: 75% of lab grade is based on the completed labs you send to your TA. We will randomly select one question from each lab to grade as pass/fail for effort, not for accuracy: making a valiant attempt at answering a question will be a pass, even if your answer is wrong. 25% of lab grade is based on leading or co-leading at least one lab session; your TA will talk to you about this during the first lab session.

Exams Mid-term exam is in a regular class period. Final exam is in the final exam period on December 11. You are not permitted to access any previous exams for this class, subject to the Honor Code.

Schedule See following page, along with readings, assignments, and overview. Readings follow.

Date	Subject	Subtopics	Readings/Assignments†
8/19	Epidemiology & society	Asking good questions	**Rothman Chapters 1-2**
8/21	Occurrence	Survival, risk, rate	**Rothman 4;** ***ME3 3****
8/25	LAB 1	Measures of occurrence	
8/26	Occurrence	Prevalence, incidence	
8/28	Contrasts	Differences, ratios, attributable proportions, 2x2 tables.	**CI 1;** ***Optional – paper 5*** **Exercise 1 out**
9/1	LABOR DAY		
9/2	Causality	Potential outcomes; exposure/intervention; Identifiability assumptions. Causal diagrams.	**CI 2, 3; Rothman 3;** ***Optional – paper 1; CI 6***
9/4	Causality		**Exercise 1 due**
9/8	LAB 2	Causality	
9/9	RCTs 1	Theory & conduct. Modification/interaction, power, generalizability, missing data (LTFU).	**CI 4, 5; Rothman 8, 9, 11;** ***Optional - CI 10***
9/11	RCTs 2		
9/15	LAB 3	RCTs	
9/16	RCTs 3	Analytic exercise in trials analysis, and standardization.	
9/18	RCT example	BAN background, statistical/ design/implementation challenges, communication (van der Horst)	**Paper 2**
9/22	LAB 4	Effect Measure Modification & Interaction & Standardization	
9/23	Observational cohorts 1	Theory & conduct. Confounding. Analysis of observational data.	**Rothman pp 69-87, 136-145; CI 7**
9/25	Observational cohorts 2		
9/29	LAB 5	Observational study theory	
9/30	Observational cohorts 3	…continuation of the above	**Rothman 10** **Exercise 2 out**
10/2	Observational example	ARIC (Heiss & Avery)	**ARIC papers (TBD)**
10/6	LAB 6	Confounding	
10/7	Linear regression	Intuitive intro to concepts in regression, scatterplots, OLS	**Rothman 12** **Exercise 2 due**
10/9	Putting it together Part I	Review of concepts so far, based on class/TA input	
10/13	LAB R1	TA-led review sessions.	
10/14	**MIDTERM**		
10/16	FALL BREAK		
10/20	LAB 7	Reading/reviewing the literature	
10/21	Case-control 1	Theory, conduct; selection bias (missing data, Berkson's bias)	**Rothman pp 87-107, 126-133; CI 8; paper 3; paper 4**
10/23	Case-control 2		
10/27	LAB 8	Case-control theory	
10/28	Case-control 3	Analysis of case-control studies (Mantel-Haenszel)	
10/30	Case-control example	Long Island Breast Cancer study (Gammon)	**(TBD)**
11/3	LAB 9	Case-control analysis; selection bias	
11/4	Surveillance/screening 1	Surveillance; screening; measurement/information bias; correcting measurement bias. Exposure assessment.	**Rothman pp 133-136; CI 9**
11/6	Surveillance/screening 2		
11/10	LAB 10	Surveillance	
11/11	Surveillance example		**(TBD)**
11/13	Hierarchies of study design	Ecologic; cross-sectional; crossover; meta-analysis. + random error; Bayesian inference.	
11/17	LAB 11	Misclassification/Information bias	
11/18	Math modeling	Basic predator-prey & SIR models (Powers)	**Exercise 3 out**
11/20	Communicating results	Visual displays of data; interacting with policy makers (Rosamond)	
11/24	LAB 12	Study theory; meta-analysis	
11/25	Conflicts of interest	Panel discussion; also broader ethical questions	**Exercise 3 due**
11/26	THANKSGIVING		
12/1	LAB R2	TA-led review sessions	
12/2	Outro/capstone	Putting it all together	
12/11	**FINAL**	At noon	

Readings

†Indicates that when not otherwise noted, a number indicates a chapter. E.g. CI 9 means Causal Inference, chapter 9.

*Italics denotes supplemental (optional) readings; all ME3 readings are optional but highly recommended.

(Rothman) Rothman KJ. Epidemiology: An introduction. 2nd edition. Oxford University Press, New York, NY, 2012.

(CI) Hernán MA, Robins JM. Causal Inference.
Available online at: http://www.hsph.harvard.edu/miguel-hernan/causal-inference-book/

(ME3) Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. Lippincott Williams & Wilkins, Philadelphia, PA, 2008.

(Paper 1) Rothman KJ, Greenland SG. Causation and causal inference in epidemiology. *Am J Pub Health*, 2005; 95(S1): S144-S150.

(Paper 2) van der Horst C, Chasela C, Ahmed Y, et. al. Modifications of a large HIV prevention clinical trial to fit changing realities: A case study of the Breastfeeding, Antiretroviral, and Nutrition (BAN) protocol in Lilongwe, Malawi. *Contemporary Clinical Trials*, 2009; 30(1): 24-33.

(Paper 3) Wacholder S. Design issues in case-control studies. *Stat Methods in Med Research*, 1995; 4: 293-309.

(Paper 4) Westreich D. Berkson's bias, selection bias, and missing data. *Epidemiology*, 2012; 23(1): 159-164.

(Paper 5) Maldonado G, Greenland SG. Estimating causal effects. *International Journal of Epidemiology*, 2002 Apr; 31,2.