

**Course Title:** Principles and Methods of Epidemiology, Spring 2014  
**Course Number:** CRN 57043 – PHCO 0502  
**Course Location:** SPH Building, 683 Hoes Lane West, Piscataway, NJ, Room 3A/3B  
**Course Date & Time:** Tuesdays 6:10 pm to 9:00 pm  
**Course Instructor:** Sheenu Chandwani, PhD

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**Office Hours:** By Appointment Only

**Course Assistant:** Susan Gabriel, Doctoral Candidate

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TA hours: 5:15pm to 6:00pm every Wednesday by appointment

**Required Course Text:** Gordis, L. Epidemiology, 4th Edition. W.B. Saunders Company, Philadelphia, 2000

Each lecture will cover 1 to 2 chapters from the textbook. Although the course generally follows the order of the book, some concepts are covered in a different order. Topics that are presented in the book but not reviewed in the lecture are considered general background or optional concepts.

**Additional/Supplemental Readings/Resources:** For each topic a list of optional links and publications that complement the lecture notes and provide an expanded view of concepts will be made available through Moodle. Some self-test exams will also be provided for your practice to evaluate your understanding after you have completed reviewing the text and lecture notes. These will be administered online through Moodle and are not graded, but the results can be viewed by the instructor. You are welcome to discuss the self-test questions with your TA and rest of the class.

**Course Description:** The overall goal of this course is to provide a foundational understanding of basic epidemiology concepts.

**Selected Department Competencies Addressed:** Each Department identifies competencies for each degree offered. The competencies addressed in this course for the MPH (or other degrees) for the Department of Epidemiology include:

- Critique epidemiologic literature, assess its strengths and weaknesses and determine if conclusion(s) are supported
- Use epidemiologic techniques to quantitatively assess patterns and changes in disease occurrence
- Formulate a specific hypothesis and determine an appropriate study design and analysis plan
- Design, implement and assess ordinary data collection systems for public health research
- Design and implement basic quality control methods during data entry and analysis
- Appropriately analyze and interpret epidemiologic data, including large national and state level datasets
- Communicate and present study findings to professional audiences

Please visit the Department webpages on the School of Public Health's website at <http://sph.rutgers.edu/> for additional competencies addressed by this course for other degrees and departments.

**Course Objectives:** At the completion of this course, the students will be able to:

1. Understand and distinguish between the most common study designs used in epidemiology.
2. Become familiar with the various applications of epidemiological methods including etiological assessment, prognosis, prevention and screening, treatment effectiveness, surveillance, health outcomes research, and health disparities.
3. Understand basic concepts of incidence and prevalence; closed, open, and stationary populations and how they relate.
4. Understand the basics of cumulative survival and the concept of risk set for time intervals.
5. Understand, create, and navigate a simple 2 by 2 table for categorical analysis including basic measures of association such as the relative risk, odds ratio, absolute risk reduction, and attributable risk.
6. Learn how to do direct and indirect standardization.
7. Understand and learn how to adjust by stratification for confounding and interpret effect modification.
8. Understand and apply parameters of tests such as sensitivity, specificity, predictive value, and likelihood ratios.

9. Understand basic biological concepts regarding immunity, herd immunity, disease transmission, and a basic approach to an epidemic.
10. Read and critique basic journal articles in epidemiology literature including extracting and interpreting the main measures of association, deciding if the design was appropriate for the study question, and assessing internal and external validity of the study.

**Course Requirements and Grading:** Students' final grade will be computed using a combination of the following assessments:

1. Homework and Discussion Assignments: 20%
2. Quizzes: 20%
3. Midterm exam: 25%
4. Final exam: 35%

### **Homework Assignments**

The primary purpose of the homework is to evaluate your understanding of the concepts and alert you to the problems you might have in understanding. Homework will be assigned for most of the lectures and will be posted on Moodle within a day following the class. They will be due on the day of next class and must be turned in by the beginning of the class to the TA. Only in-person submissions will be accepted. Homework submissions made through email or Moodle will not be accepted. A "pass" grade will be assigned if the homework is done on time with a "reasonable" degree of effort in answering all the questions. Late homework will automatically get a grade of zero. It is acceptable to discuss the concepts and share ideas with one another in doing the homework, but you must hand-in your own independent work. Homework answers will be posted on Moodle after the due date and the graded homework will be returned the following week.

### **Discussion Assignments**

Four scientific papers will also be assigned as a part of the homework during the semester. You will be required to submit a written 1 page (no more than 350 words) review/critique of the paper at the beginning of the next lecture. Open discussions on the paper will be conducted after the lecture is completed. You are expected to read the papers before coming to the next class to participate in those discussions.

### **Quizzes (02/25/2014 and 04/22/2014)**

Two quizzes will be given before each exam to give students the opportunity to gauge their current level of understanding of the course material before they appear for the exam. They count for 20% of your grade, but the higher quiz score will be weighted more than the lower quiz score. The quiz will usually be administered in the class before the lecture. You will be given 30 minutes to 45 minutes to complete the quiz. Generally these are multiple choice and short answer questions with some calculations. Please show all the calculations to get partial credit for understanding a concept. No collaboration is allowed on quizzes and they are not open-book.

## **Examinations (03/25/2014 and 05/13/2014)**

There will be two exams: Mid-term and Final. Both exams will have a format consisting of multiple choice, short answer, and calculation questions. They generally take 1.5 to 2 hours to complete although you have the full class time if needed. The exams are cumulative in terms of covering the course materials. No formula sheets or notes will be allowed.





It is important to have a reasonable understanding of concepts covered in each lecture before going on to the next because the concepts in most lectures build on what you have previously learned.

## **Requirements and Expectations**

Attendance is expected for all classes. You will be asked to sign in on a sheet before the class begins so that we know who attended the class. We reserve the right to use class participation when deciding a "cut-off" grade (for someone right on the boundary). If you have to miss a quiz or an exam, you must have a valid excuse and we may give you a different version (but the same complexity) of the exam. Please notify either the TA or the instructor if you know in advance of any issues that will prevent you from sitting for an exam or quiz. If you are unable to attend a class please make arrangements to hand in your submissions (if any are due that day) to the TA or the instructor in advance.

It is important to have a reasonable understanding of concepts covered in each lecture before going on to the next because the concepts in most lectures build on what you have previously learned.

**Course Schedule:**

Week	Date	Topic	Book Readings	Homework
1	01/28/2014	Introduction and Overview of Epidemiology	Gordis Ch 1	Homework 1
2	02/04/2014	Measurement of Disease Occurrence	Gordis Ch 3, 4	Homework 2
3	02/11/2014	Standardization Survival Analysis Introduction to Study Design	Gordis Ch 4, 6	Homework 3
4	02/18/2014	Measurement of Association	Gordis Ch 11, 12	Homework 4
5	02/25/2014	<b>Quiz 1</b> Randomized Trials 	Gordis Ch 7, 8	Homework 5 Article 1
6	03/04/2014	Cohort Studies Attributable Risk Article 1 Discussion	Gordis Ch 9	Homework 6 Article 2
7	03/11/2014	Rules of Causation Article 2 Discussion Review for Midterm	Gordis Ch 12, 14	No Homework
	03/18/2014	<b>SPRING BREAK- NO CLASS</b>		
8	03/25/2014	<b>Mid-term Examination</b> 	--	No Homework
9	04/01/2014	Case-Control Studies Statistical Inference	Gordis Ch 10, 20	Homework 7 Article 3
10	04/08/2014	Bias, Confounding, and Interaction Article 3 Discussion	Gordis Ch 15	Homework 8 Article 4
11	04/15/2014	Diagnostic and Screening Tests Article 4 Discussion	Gordis Ch 5, 18	Homework 9
12	04/22/2014	<b>Quiz 2</b> Outcomes Research 	Gordis Ch 17	Homework 10
13	04/29/2014	Infectious Disease Epidemiology (Guest Lecture)	Gordis Ch 2	No Homework
	05/06/2014	<b>READING DAYS- NO CLASS</b>		
14	05/13/2014	<b>Final Examination</b> 	--	

**School of Public Health Honor Code:** The School of Public Health Honor Code is found in the student bulletin ([sph.rutgers.edu/academics/catalog/index.html](http://sph.rutgers.edu/academics/catalog/index.html) ). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, and to refrain from receiving and/or giving aid on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity, each student is expected to contribute to the academic integrity of the school community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

**Policy Concerning Use of Recording Devices and Other Electronic Communications Systems:**

When personally owned communication/recording devices are used by students to record lectures and/or classroom lessons, such use must be authorized by the faculty member or instructor who must give either oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.