



**PM512: PRINCIPLES OF EPIDEMIOLOGY**

**4 Units**

**Fall 2021**

**Section 41109 Monday 9:00 AM – 12:50 PM**

**Section 41096 Monday 1:00 PM – 4:50 PM**

**Location:** SSB 115/116

**Instructor: Amie E. Hwang, PhD**

**Office:** SSBI 305G or by zoom

**Office Hours:** Tuesday 11am or by appointment

(Zoom <https://usc-hipaa.zoom.us/j/96194596565>)

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**Teaching Assistant Section 41096: Stephanie Navarro**

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**IT Help:** ITEAMS

**Hours of Service:**

**Contact Info:** iteam@usc.edu

## Course description

Principles of Epidemiology emphasizes a mastery of introductory methods of epidemiological research. The course begins with a discussion of the nature of epidemiology and causation. Students will learn about the issues and challenges of causal inference in epidemiologic research. Measures of disease occurrence, age-standardization, and measures of association will be covered in lecture as well as practiced in applied homework problems. The importance of descriptive epidemiology and the presentation of data by person, place, and time will be introduced and examples reviewed during interactive discussion of health research articles. Students will learn about analytic and observational study designs, the process of conducting each design, strengths, limitations, and issues of design selection and feasibility. Matters of selection bias, information bias, confounding, and effect modification will be discussed and students will gain practice in recognizing and evaluating these issues in a critique of a health article. Additional topics covered in the course include, validity and reliability of tests and the process of outbreak investigation.

## Learning objectives

1. To provide students in epidemiology, biometry, public health and other health fields with an introduction to the basic principles of epidemiology.
2. To provide students with the skills and knowledge to:
  - a. investigate the epidemiology of a specific disease or other health-related phenomenon.
  - b. critically evaluate population-based research studies designed to test health-related hypotheses.

## Prerequisite

Algebra (recommended)

## Course Notes

Students will be awarded a letter grade at the end of the course. Students are expected to have read the assigned reading prior to our meeting time and complete the homework the week after the lecture material is presented. All students will be expected to actively discuss the lecture material and assigned reading during class. Students will be evaluated by homeworks, short writing activities, active participation, and a midterm, a take home critique and a midterm and final written exam.

## Technological Proficiency and Hardware/Software Required

Students will need to have access to a laptop or desktop computer to access class materials on Blackboard. Students will need to bring their laptop for in class exam. If you have any issues with access to a computer, please bring to the attention of the professor.

## Required Readings and Supplementary Materials

### Required Textbooks:

- Rothman, K. J. (2012). *Epidemiology—an introduction*. (2nd ed.). New York: Oxford University Press. ISBN-10: 0199754551 ISBN-13: 978-0-19-975455-7

- Hennekens, C. & Buring, J. (1987). Principles of Epidemiology: Epidemiology in Medicine. Little Brown & Co. 9780316356367

Recommended:

- Kelsey, J. L., Whittemore, A. S., Evans, A. S., & Thompson, W. D. (1996). Methods in observational epidemiology. New York: Oxford University Press. ISBN-13: 978-0195083774

Articles: Please refer to the weekly reading table in this syllabus for a complete list of articles or other readings. All course articles can be accessed via the USC E-Reserves system (<http://nml-236.usc.edu/eres/coursepage.aspx?cid=936>), or Blackboard

## Description and Assessment of Assignments

<u>Component</u>	<u>Percentage of Final Grade</u>
Participation	5%
Review of Health Article	5%
Study Critique	30%
Quiz	5%
Midterm	25%
Final Exam	30%
<b>Total Percentage</b>	<b>100%</b>

### Participation & Discussion (5%)

Student's participation grade will be based on participation in discussion board and online live lab sessions.

### Review of Health Article "Epi in the News" (5%)

Student will select a lay audience article on an observational or experimental health study. Article can be published in a newspaper, magazine, or on-line publication that summarizes the research design, analysis and results of the original publication. The summary article should have enough information to write a 1-page summary of article without accessing the original journal article on which it was based. The 1 page summary will be graded on 10 points based on the student's responsiveness to each of the requested summary items (i.e. study design, exposure and outcome, hypothesis or question, source of data, primary result(s), discussion of at least 5 of Hill's Causal Criteria as they are demonstrated in article).

### Study Critique (30%)

The study critique is a written review of a health research article that will be provided to the students. A set of critique questions will be provided to the students that is a modification of PM 512 Principles of Epidemiology general critique outline and is specifically tailored to the health article. The critique is considered a second course midterm; each student will have approximately 2 weeks to answer the questions and submit their final typed responses. This is an independent assignment where each student will hand in their own written responses that reflect their answers and understanding of the material. However, students are allowed to discuss the article

with their classmates or professor before writing their final answers for submission as part of the learning process of evaluating health articles and understanding issues of bias. The critique will be based on approximately 95-100 points. You will have an opportunity to practice writing a study critique of an assigned article prior to submitting your final critique.

#### Quiz (5%)

A quiz during week 4 will cover homework completed on Measures of Disease Occurrence and Age Adjustment (see week 2). Quiz will be a combination of calculations (similar to homework), true-false, and short answer. Quiz will include a total of 16-20 points. There is extra credit available for this quiz.

#### Midterm (25%)

The midterm exam will include material from weeks 1 -7. Students will be tested on epidemiologic concepts from the lecture material and homework. Students should be able to recognize and demonstrate understanding of concepts and methods in example problems, synthesize concepts across lectures, make calculations and solve problems similar to homework problems and when combining methods across homework problems. Midterm will include short answer, calculations, and true-false.

#### Final Exam (30%)

The final exam will include material from the full semester, with an emphasis on material after the midterm. Students will be tested on epidemiologic concepts from the lecture material and homework. Students should be able to demonstrate understanding of concepts and methods learned in lecture material, reading, and homework from the semester.

#### Homework

Homework are not graded, but they are an essential part of the course. Homework should be completed, and students should be prepared for discussion the week after assignment. Participation scores are based on student's preparation for and involvement in the lab.

#### Weekly Reflection (Extra Credit, 10 points on the final)

For extra credit, students may choose to complete a weekly journal reflecting on their learning for the week. Students must complete 10 prospective weeks journal reflections to receive credit. The reflections must be received by midnight Saturday night. Students may not submit reflections from past weeks.

### Grading Principles

Grades for Principles of Epidemiology will be based on a weighted scale, with each student earning 5% to 30% for each of the 6 categories above. A student's final grade will be based on a straight scale where the student is guaranteed the minimum grade if they achieve the following percentiles:

<u>Grade</u>	<u>Ranges</u>
A	93.0% or higher
A-	90.0%-92.9%
B+	87.0%-89.9%
B	83.0%-86.9%
B-	80.0%-82.9%
C+	77.0%-79.9%
C	73.0%-76.9%
C-	70.0%-72.9%
D	60.0%-69.9%
F	59.9% or lower

### Assignment Submission Policy

Homework assignments and exams will be submitted through Turnitin on Blackboard folders.

### Grading Timeline

Grading and feedback for homeworks (if applicable) will be completed within 1-2 weeks of submission, depending on the timing of material in the syllabus to allow discussion in class. Grading and feedback of the in-class midterm and final will be within 1 week of completion.

### Additional Policies

Students are expected to attend all lecture-discussion meetings unless absences are pre-approved by the professor. If there are any issues that prevent you from attending class or completing your homework as scheduled, please contact your professor by email or text as soon as possible to make arrangements.

Students are expected to treat everyone in the class (students and professor) in a respectful manner with patience for listening to different view points. If any issues develop during the class of concern with respect to material, ability to complete assignments, or personal issues you are welcome to contact your professor by appointment or during office hours to discuss and resolve. COVID19 and other issues have presented many unusual challenges to everyone in and out of the classroom this year and I am open to flexibility to solve issues together as these arise with good communication.

### Lateness

Items that are submitted late will receive 10% off the grade per day unless the student has already talked with the professor and pre-arranged that they will be absent.

### Disability Accommodation

Any student requesting academic accommodations based on a disability or medical issues is required to register with Office of Student Accessibility Services (OSAS) each semester. A letter of verification for approved accommodations can be obtained from OSAS. Please be

sure the letter is delivered to me as early in the semester as possible. OSAS is located in GFS 120 and is open 8:30 am – 5:00 pm, Monday through Friday. Website for DSP: <http://osas.usc.edu> and contact information: (213) 740-0776 (Phone), (213) 740-8216 (FAX), [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu) (Email).

### COVID-Related Guideline

Students displaying symptoms of illness should not be in the classroom. Students in need of special accommodation (ie. Lecture recording or make up exams) must contact Office of Student Accessibility Services to make a request. The instructor is expected to conduct in-person teaching as the highest priority. The instructor will do what is necessary to ensure continuity of education and provide ad-hoc accommodations on as-needed basis. However, any formal, long term or foreseeable accommodation must be made by the Office of Student Accessibility Services.

If a student or number of students test positive in class, Student Health and Environmental Health and Safety will do contact tracing and conduct evaluation to decide whether class will be canceled or switch to online.

Refer to USC Return to Campus guidelines for more details.

<https://we-are.usc.edu/phases-and-guidelines/>

## LECTURE & ASSIGNMENT SCHEDULE

	<b>Lecture</b>	<b>Lab</b>	<b>Readings/Preparation<sup>1</sup></b>	<b>Homework</b>
Week 1 8/23/21	The Nature of Epidemiology Causal Inference Populations in Epidemiology Pandemic: COVID 2019	Rothman article	Rothman: Ch 1-3 Hennekens: Ch 1,3	HW 1: Levels of Prevention HW 2: Snow on Cholera
Week 2 8/30/21	Measures of Disease Occurrence Age-Adjustment	Review HW 1, 2	Rothman: Ch 4 (38-56) Hennekens: Ch 4 (54-72)	HW 3: Rates HW 4: Age- Adjustment
9/6/21	<b>NO CLASS – Labor Day</b>			
Week 3 9/13/21	Rates Review Study Designs Part 1 Descriptive Epidemiology & Studies	Review HW 3, 4	Mausner: Ch 4, 6 (D, E) Hennekens: Ch 2, 5 Descriptive papers	HW 5: Extra Rates
Week 4 9/20/21	Study Design Part 2 Cohort Studies Case Control Studies <b>QUIZ: rates and age- adjustment (1 reference sheet)</b>	Review HW 5 Descriptive papers	Rothman: Ch 5 Hennekens: Ch 6, 7	Assign “Epi in the News”
Week 5 9/27/21	Study Design Part 3 Cross-Sectional Studies Ecological Studies Experimental Studies Study Design Comparison	Study Design Examples Review Quiz	Hennekens: Ch 8	HW 6A: Study Design A HW 6B: Study Design B
Week 6 10/4/21	Survival Analysis Randomized Clinical Trials <i><b>DUE at 12pm: “EPI IN THE NEWS” assignment</b></i>	Review HW 6A, 6B	Rothman: Ch 13 (242- 248) WHI Article: Effects of Conjugated Equine Estrogen in Postmenopausal Women with Hysterectomy	HW 7: Survival Analysis HW 8: Randomized Trial
Week 7 10/11/21	Relative Risk Attributable Risk	Review HW 7, 8	Rothman: Ch 3 (27-28); Ch 4 (57-68) Hennekens: Ch 4 (73- 100); Ch 10	HW 9: Relative Risk HW 10: Attributable Risk HW 11: Bladder Cancer
Week 8 10/18/21	Bias Confounding	Review HW 9, 10, 11	Rothman: Ch 7 Hennekens: Ch 11, 12	<b>STUDY FOR MIDTERM</b>

	Lecture	Lab	Readings/Preparation <sup>1</sup>	Homework
Week 9 10/25/21	<b>MIDTERM</b>			
Week 10 11/1/21	Introduction to Study Critique Effect Modification		Rothman: Ch 11	HW 12: Review sample critique HW 13: Confounding, Bias, Effect Modification
Week 11 11/8/21	<b>HANDOUT: STUDY CRITIQUE</b> Validity & Reliability of Tests Evaluation of Screening Programs	Review HW 12, 13	Rothman: Ch 13 (235- 242) Hennekens: Ch 13	HW 14: Validity & Reliability of Tests HW 15: Screening Evaluation Study Critique Part 1
Week 12 11/15/21	Meta-Analysis	Review HW 14, 15	MERS article	Study Critique Part 2
Week 13 11/22/21	Acute Epidemiology & Outbreak <i>Study Critique all parts due 9pm</i>	Outbreak Investigation		Extra homework
Week 14 11/29/21	COVID-19 information and status Course Evaluation	Review Extra practice homework		Study for final exam
FINAL 12/6/21	<b>FINAL EXAM</b>			

<sup>1</sup>Chapters in required textbook: Rothman, K., Epidemiology an Introduction. Recommended textbook: Hennekens., Epidemiology in Medicine.

Syllabus refers to Mausner's book chapters.



## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*  
[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*  
[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*  
[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*  
[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*  
[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Student Accessibility Services - (213) 740-0776*  
[osas.usc.edu](http://osas.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.