# Epidemiology I, CLRE 251

Summer Quarter, 2024
2 Units

## Course Information

*Meetings*:   Tuesdays, 2:00 – 3:50pm
*Dates*:      07/02/2024 - 09/10/2024
*Location*:   UCC, Room 317

## Course Instructor

*Name*:      Richard Y. Calvo, MPH, PhD
*Email*:      rycalvo@health.ucsd.edu
*Office*:     By appointment via Zoom

## Course Description

This course is designed to introduce the foundational concepts of epidemiological methods and measurement in human populations. Emphasis is placed on study designs, measurement of associations, and threats to the validity of research efforts. At the conclusion of this course, students are expected to have developed the skills needed to plan their own research, measure the appropriate characteristics and associations, and  address the veracity of clinical research literature.

## Learning Objectives

Upon successful completion of this course, students should be able to:

1. Describe the major objectives of epidemiology

2. Describe the structure of major epidemiologic study designs, as well as their strengths and weaknesses for studying various health outcomes
3. Define and calculate measures of disease occurrence and measures of association that quantify the relationship between exposures or risk factors and health outcomes

4. Describe and identify major threats and limitations that affect research. This includes preemptively addressing sources of bias, confounding, and measurement error
5. Understand the components of causality, measurement validity, and "comparability" across populations, risk factors, and results

## Course Textbook & Resources

*Textbook:* Gordis Epidemiology, Sixth Edition, David Celentano & Moyses Szklo, 2020.
*ISBN-13*: 978-0323552295, ISBN-10: 0323552293

**Course Connectivity**

Summer 2024 instruction for this course will be delivered in-person. However, the following tools will aid in information delivery outside the classroom:

*Zoom*: Office hours are conducted via Zoom. UCSD has provided all enrolled students with Zoom Pro accounts. If you have not yet claimed your account, please follow the instructions at: https://blink.ucsd.edu/technology/file-sharing/zoom/index.html. When joining a Zoom session, please first sign-in to Zoom using the UCSD Secure Sign On (SSO) function.

*Canvas*: All course announcements, slides, recordings, assignments (homework and labs), and exams will be distributed via Canvas. To ensure that you receive course announcements in a timely manner, please update your notification settings so that Canvas Announcements and Inbox Conversations are forwarded to your email address.

*Gradescope*: This service will be used for the submission and grading of assignments and exams.

**Course Format**

Each class session consists of a "lecture" and "lab" component.

**Lectures**

Each session will begin with a lecture lasting approximately one hour and will cover key aspects of the reading as they relate to clinical research. Lectures focus on a specific component of epidemiology and will include real-world examples pertaining to its importance and utility. Lecture information is cumulative in that material covered in each session will build on information provided in prior sessions. Students are encouraged to ask questions and engage in discussions with the lecturer.

**Labs**

Lab sessions are designed to be an interactive learning experience and will begin after the lecture session. Each lab session consists of an assignment that is, in essence, an series of epidemiologic problems that provide practice on the concepts covered in lectures, assigned readings, and homework assignments. Students will be placed in groups and should work together to complete each lab assignment. Every member of a group must contribute to the work and should be prepared to discuss the results with the entire class. Groups will reconvene at approximately 5:30pm each week to discuss responses.

Lab assignments (one per group) must be submitted via Gradescope prior to the start of the next week's lecture. Late work cannot not be accepted without valid reason. If you are absent, you will be responsible for individually completing and turning in an alternative lab assignment.

**Course Evaluation**

Course grades will be based on five components and are allocated as follows:

*Participation: 10%*

*Lab assignments*: 20%

- Lab assignments will be found on Canvas immediately after the lecture is completed. There are **nine** in total

*Homework assignments*: 20%

- **Five assignments** will be distributed via Canvas. See the schedule for due dates

*Midterm exam*: 20%

- *The **midterm exam** will address material up to the week before the midterm*

*Final exam*: 30%

- *The **final exam** will include questions regarding material from throughout the quarter*

***Exams cannot be retained, copied, replicated, or photographed and the originals will be retained by the instructor.*** Students may establish an appointment with the instructor to review and discuss their exams.

Final letter grades will be determined using the following scale:

| A | B | C | D | F | Pass/Fail |
|---|---|---|---|---|---|
| A+ = 97.0-100 | B+ = 87.0-89.9 | C+ = 77.0-79.9 | | | |
| A = 93.0-96.9 | B = 83.0-86.9 | C = 73.0-76.9 | 60.0-69.9 | ≤59.9 | Pass ≥ 70 |
| A- = 90.0-92.9 | B- = 80.0-82.9 | C- = 70.0-72.9 | | | |

**Student Evaluation of Course and Faculty**

Course and faculty evaluations provide important feedback to instructors to improve course content and teaching methodology. Teaching evaluations are also an important factor in faculty advancement, merit and promotion. To facilitate ease of completion of evaluations an electronic format has been implemented in Qualtrics. You will receive an email at the end of the quarter with the link to the questionnaire.

**Policies**

*Attendance*: This course is designed to provide an interactive and dynamic environment for learning. While there is no penalty for absences for valid reasoning, students are ultimately

responsible for learning the information and submission of missed work. Course participation is a key element

*Missed Assignments*: If there are extenuating circumstances resulting in an absence for a presentation or assignment this must be communicated to the instructor via email preferably prior to the session, but no later than 24 hours after the absence. Otherwise, <u>late assignments cannot not be accepted.</u>

*Professionalism*: Please attend to all university policy and classroom etiquette procedures. Those not heeding the policies will be asked to leave the classroom immediately so as to not disrupt the learning environment. Please arrive on time, be attentive, and respectful for all class meetings. Students who habitually disturb the class by talking, arriving late, or other unprofessional behavior may suffer a reduction in their final grade.

*Academic Conduct*: All work submitted in this course must be your own and produced exclusively for this course. The use of sources (ideas, quotations, and paraphrases) must be properly acknowledged and documented. If in doubt, you are encouraged to review guidelines for the proper use of sources, as well as UCSD's policy on plagiarism and other forms of academic misconduct. You are responsible for knowing what constitutes academic misconduct at UCSD and is defined at: http://academicintegrity.ucsd.edu/. The official university policy on the Integrity of Scholarship can be found here: http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2. If you suspect another student of academic misconduct, you are strongly encouraged to report it. Any suspicion of academic misconduct during an exam will be reported to the Office of Academic Integrity for review and process. The Office of Academic Integrity will determine whether or not a violation has been committed and the consequences of that violation. During exams you are expected to follow instructions. Failure to do so can be considered misconduct.

*Disability Access*: The University is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats upon request. Students must contact the Office for Students with Disabilities (OSD) who will provide an Authorization for Accommodation (AFA) letter verifying the disability. Students will receive the appropriate accommodations from the day that they provide Dr. Calvo with the AFA letter. Course accommodations cannot be applied retroactively.

*Title IX Compliance*: The University recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will not be tolerated. If you have been the victim of sexual misconduct, physical and/or psychological abuse, I encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator.

*Usage of Large Language Models and Generative Text Artificial Intelligence*: Use of these tools for the purposes of reference is to be pursued at your own discretion. The student is responsible for the validity and completeness of submitted work. Use of generative artificial intelligence for

the purposes of completing assignments or answering text questions is extremely discouraged and could result in automatic disqualification from the course.

# COURSE SCHEDULE, SUMMER 2024 Epidemiology I

**Instructor:** Richard Y. Calvo, MPH, PhD
**Sessions:** Tuesdays, 2:00 to 3:50 PM, from July 2 to September 10, 2024
**Class Location:** UCC, Room 317
**Textbook:** <u>Epidemiology</u> by Leon Gordis

| Session (Date) | Topic | Description | Textbook Sections |
|---|---|---|---|
| 1 (07/02) | Disease Transmission | • Evaluate methods and measures of disease transmission | Ch. 1 Ch. 2 |
| 2 (07/09) | Measurement | • Measurement of associations, strength, and direction | Ch. 3 Ch. 4 |
| 3 (07/16) | Cross-sectional Studies | • Basic summary of all study designs to be discussed over the quarter<br>• Detail on cross-sectional and ecological study designs | Ch. 10, p. 208-212 |
| 4 (07/23) | Prospective/Cohort Studies | • Detailed evaluation of prospective/cohort studies, basic limitations, and measurement<br>• Facets of longitudinal study design<br>• **Homework #1 Due** | Ch. 9 Ch. 11, p. 215-220 Ch. 12 |
| 5 (07/30) | Case-Control Studies | • Detailed evaluation of case-control studies, their limitations, methods of measurement<br>• Comparison of matched vs. unmatched designs<br>• **Homework #2 Due** | Ch. 10, p. 189-206 Ch. 11, p. 220-227 Ch. 13 |
| 6 (08/06) | Midterm & Experimental Designs | • **Midterm (no lab session)**<br>• Introduction to intervention studies, experimental studies, and randomized trials | Ch. 7 Ch. 8 |
| 7 (08/13) | Causality | • Austin Bradford-Hill's Causal criteria<br>• Comparison between relationships and causal associations<br>• **Homework #3 Due** | Ch. 14 |
| 8 (08/20) | Limitations and Caveats | • Biases, Confounding, and Effect Modification | Ch. 15 |
| 9 (08/27) | Screening & Diagnostic Tests | • Measurement of performance of screening and diagnostic tests<br>• **Homework #4 Due** | Ch. 5 Ch. 18 |
| 10 (09/03) | Course Review | • Review of all course in preparation for the final exam | - |
| 11 (09/10) | Finals | • **Final Exam**<br>• Cumulative | - |