



Department of Public Health Sciences
Fall 2022: HLTH 3800 Epidemiology

Class Meetings in Poole A202:

CRN 81609, Section 1: T and Th, 9:30 am – 10:45 am

Catalog Description: Introduction to epidemiological principles and methods used in the study of the origin, distribution, and control of disease.



Expanded Description: This course will provide an overview of the theory, methods, and uses of epidemiology, particularly regarding public health promotion. Epidemiology is used to study the etiology (cause) of health conditions by analyzing human data, and by incorporating knowledge from other biomedical and behavioral science disciplines. Epidemiology is considered the basic science of public health, and epidemiological methods are integral to the development of disease causation theories and disease prevention and control efforts.

Pre-requisite: A 2000-level HLTH course or permission of instructor.

Pre- or Co-requisite: Approved statistics course (STAT 2300 or 3090 required for HLTH majors)



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Office Hours: T and Th 11am - Noon; T 3:30 – 4:30pm, or by appt.

Important Dates:

Date	Event
Varies	Current Event Presentation
9/13/22	Test 1
9/29/22	Test 2
10/6/22	Class Descriptive Epi Activity
11/1/22	Class Article Citation Activity
11/3/22	Test 3
12/1/22	Test 4
12/8/22	Article Synopsis Due
12/14/22	Final

Course Objectives:



The ultimate goal for this course is to have a student develop a solid understanding of the fundamental principles of epidemiology which enables the student to critically evaluate the credibility and significance of reported health research findings. During the course, students will learn how knowledge about disease occurrence has evolved and the factors influencing changes in etiologic methodology. Students will learn to differentiate between types of epidemiologic approaches and to recognize potential threats to an epidemiologic study's internal validity. Students will also learn to judge whether an observed epidemiologic association may represent a truly causal relationship.

Clemson Thinks2:

This course is designed to be part of the Clemson Thinks2 (CT2) program. "Critical thinking is reasoned and reflective judgment applied to solving problems or making decisions about what to believe or what to do. Critical thinking gives reasoned consideration to defining and analyzing problems, identifying and evaluating options, inferring likely outcomes and probable consequences, and explaining the reasons, evidence, methods and standards used in making those analyses, inferences and evaluations. Critical thinking is skeptical without being cynical, evaluative without being judgmental, and purposefully focused on following reasons and evidence wherever they may lead." <https://www.insightassessment.com/FAQ/FAQs-What-is-Critical-Thinking>

Learning Outcomes:

Upon completing this course, the student should be able to:

- Describe the evolution of the field of epidemiology, the scientific study of the distribution and determinants of disease.
- Utilize epidemiologic concepts, including significant health and disease occurrence measurements.
- Recognize different types of epidemiologic study designs and understand why different approaches are utilized in the study of disease causation.
- Compute and interpret appropriate measures of association between exposures of interest and health outcomes of concern.
- Apply and appraise the relevance of epidemiological findings for health professionals.



Unit Outline:

Unit I	Introductory Epidemiologic Concepts and Measures
Unit II	Epidemiologic Study Designs
Unit III	Evaluating the Validity of an Epidemiologic Association
Unit IV	Screening for Disease Prevention

Learning strategies:

- Lecture presentations and "skeleton" student slides
- Text and supplemental readings
- Practice problems
- Class and small group discussions & activities
- Quizzes and examinations

Grading:

1. Course Quizzes, Examinations and the Cumulative Final

Your grade will be primarily based upon your exam performances. There are several tests during the term that focus specifically upon a few key concepts at a time. The final is cumulative, and the final is required in this course (*i.e.*, students with an A average may not exempt the final).



The format for most exams will include a set of multiple choice, matching, and true/false questions to be answered in class on your laptop using the Respondus Lockdown browser. Typically, a set of short-answer questions that involve employing disease causation concepts and epidemiological formulas will also be included. **You will need a calculator when taking exams for this course. The questions that correspond to the online section of each exam will only be available to review with the instructor.**



If you miss a scheduled exam and did not make arrangements ahead of time to take an alternate one, please plan to make up that missed exam during the final examination period along with taking the final.

In addition, there will be a series of online chapter quizzes available during the semester that also require the use of the Respondus test-taking tools. Students may take as many or as few as they feel are necessary to prepare for the major exams. For students who attempt all of these quizzes, they may omit their lowest score prior to receiving their final course quiz average. The overall quiz average counts 5% towards your overall grade.

2. Current Events Assignment

Each student working alone or with a partner must identify a contemporary epidemiologic topic in “the news” and prepare a short (< 10 minute) presentation for the class explaining this issue. Prior to the class presentation, students must share a pertinent resource with the instructor with the understanding that this resource will be shared with the rest of the class as follow up or reference pertaining to the topic. In addition, the presenter(s) must create a suitable quiz question related to the presentation and submit it to the instructor with its answer clearly identified. These current event questions will be included on the course quizzes.

3. Descriptive Epidemiologic Disease Distribution Research Activity

Working in groups, students will research and present current statistics utilizing various health data resources. Students will be encouraged to carefully assess the data sources for how the organization collected and compiled their information (*i.e.*, *know which agency generated the information; was it “chain of command” and complete coverage or sampled data?*) and to consider the credibility of the information and its limitations. Several of the research queries may not have one “exact answer”, but rather answers that depend upon the search strategy employed to locate the descriptive information. Students should keep track of how they “searched out” the information and note the citation for the source of statistic they find including the weblink (URL address). This activity will be done in class on Thursday, October 6th.



4. Group Epidemiologic Article Citations Activity

Working in a small group in class on Tuesday, November 1st, students are expected to locate 2 peer-reviewed journal articles pertaining to a topic of their group's choice. Each article must describe a specific analytic epidemiologic study related to the topic (case-control, cohort or intervention study). A citation bibliography that labels what type of study is presented in each cited article as well as the group's opinion about the appropriateness of using this article for the upcoming critique assignment is due following the activity. The identified articles should be cited completely (authors, title, name of journal, publication date, volume and page numbers) and an URL linking to the specific article publication provided.

5. Article Critique Synopsis

A key objective for this course is to have you learn how to appraise the value of original health research to help interpret the worth of emerging information. When an analytic epidemiologic study is published in a peer-reviewed journal, it is important for you to be able to identify the following concepts:

- i. Context and Rationale for the Study (*Why was it done?*)
- ii. Research Hypothesis (*Are the exposure and health outcome being studied clear?*)
- iii. Epidemiologic Study Design (*What type of analytic epidemiologic study design was employed?*)
- iv. Results of the Study (*What is the major finding(s) in the study related to the research hypothesis?*)
- v. Issues of Interpretation for the Study (*What are the major strengths or weaknesses of the study described in your article, considering issues of internal validity, such as the influence of chance, bias & confounding?*)
- vi. Significance of the Study (*What is the "big picture" contribution of this study, considering external validity issues associated with the research?*)

The challenge of a critical review is to discern the “basics” of each study and consider whether you personally feel that the researchers contributed something important to our understanding of the selected topic.



Working in a small group, students are expected to prepare a formal critique of a selected peer-reviewed journal article describing an analytic type of epidemiologic study. **The critique synopsis is due on Thursday, December 8th** and will be assessed adhering to the following grading rubric:

0.5 pt – Article properly cited at beginning of report

0-1 pt – Discussion of context and rationale for study

0-1 pt – Description of research hypothesis (clearly identified exposure and outcome of interest)

0-2 pts – Description of study design, including use of clear epidemiologic terms (should also mention some details of methods, time period of study, sample size, ...)

0-1.5 pts – Identification of key results (*identify most pertinent & significant findings & there is no need to review basic demographic characteristics of the study group*)

0-2 pts – Discussion of issues of interpretation (*internal validity assessment*)

0-2 pts – Review of authors' conclusions & student's personal opinion (*considering criteria for causality*) about “big picture” causation concepts

(Total = 10 points)

Note: Up to one point will be deducted from group members who do not contribute!

Your Course Grade will be determined in the following manner:

1. Exams

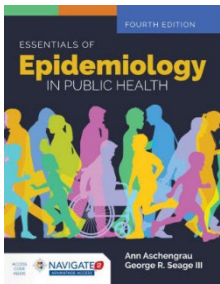
Quiz Average	5%
Test 1	12.5%
Test 2	12.5%
Test 3	15%
Test 4	12.5%
Cumulative Final Exam	20%

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|---|------------|
| 2. Current Events Presentation Assignment | 5% |
| 3. Group Descriptive Epi Activity | 5% |
| 4. Group Epi Article Citation Activity | 2.5% |
| 5. Article Critique Synopsis | <u>10%</u> |
| | 100% |

Grading Scale:

A = 90.0 - 100
B = 79.5 - 89.9
C = 69.5 – 79.4
D = 60.0 – 69.4
F = 59.9 or Below

Course Textbook:



Aschengrau, A. and G. Seage. Essentials of Epidemiology in Public Health: 4th Edition. Jones & Bartlett Learning. Burlington, MA. 2020. ISBN: 978-1-284-12835-2

Assigned Readings & Lecture Materials Available in Reader & Canvas:

Since the material presented in this course is typically unfamiliar to the student, it is important for each student in the class to keep up with the readings and any practice problems every week. The material is based primarily on discussions of the assigned textbook reading with some additional reading made available by the instructor in Canvas. Fill-in-the-blank (skeleton) versions of most of the lecture slides are available digitally in our course's Canvas Learning Unit Modules. Recommended practice exercises and solution keys are also available.

Copyright Statement:

Materials in this course are copyrighted. They are intended for use only by students registered and enrolled in this course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act. Refer to the Use of Copyrighted Materials and “Fair Use Guidelines” policy on the Clemson University website for additional information: <http://www.lib.clemson.edu/copyright/>



COURSE SCHEDULE:

DAY(S) & DATE (S)	TOPIC & CLASS ASSIGNMENTS	ASSIGNED READING (<i>italics indicates an optional reading assignment</i>)
Th, 8/25	1 ST CLASS - Fundamental Approaches in Epidemiology	Text Chapter 1
T, 8/30	History of Epidemiology	Merrill (2017) Ch 2; Stone (1996) Ch 2 (in Canvas Module I)
Th, 9/1	Germ Theory	Friis & Sellers, Chapter 13 (in Canvas)
T, 9/6	Modern Epidemiology ONLINE LECTURE ONLY TODAY	Text Ch 15, pp. 399-402; <i>Semmelweis & Krieger articles</i> (in Canvas)
Th, 9/8	Conceptual Models of Disease Causation	
T, 9/13	Test 1	
Th, 9/15	Measures of Disease Frequency	Text Chapter 2
T, 9/20	Mortality Measures	
Th and T, 9/22 and 9/27	Rate Adjustment	Text Ch 3, pp.69-73
Th, 9/29	Test 2	
T, 10/4	Sources of Health Data	Text Chapter 4
Th, 10/6	Descriptive Epidemiology; Class Descriptive Epi Research Activity	Text Chapter 5
T, 10/11	Overview of Epi Studies	Text Chapter 6
Th, 10/13	Des Epi Study Designs	
T, 10/18	Measures of Association	Text Chapter 3
Th, 10/20	Experimental Studies & Ethics of Human Research	Text Chapters 7
T, 10/25	Cohort Studies	Text Chapter 8
Th, 10/27	Case-Control Studies	Text Chapter 9
T, 11/1	Unit Conclusions & Group Epi Article Citations Bibliography Activity	
Th, 11/3	Test 3	
T, 11/8	FALL BREAK	
Th, 11/10	Internal Validity & the Role of Chance	Friis & Sellers, Ch 10 (Canvas Module 4) and Text Ch 12, pages 315-329
T, 11/15	Role of Bias	Text Chapter 10
Th, 11/17	Role of Confounding and Effect Measure Modification	Text Chapter 11 and Chapter 13
T, 11/22	External Validity Considerations	Text Chapter 15
Th, 11/24	THANKSGIVING	
T, 11/29	Unit Conclusions and <i>Class workday for article critique activity</i>	
Th, 12/1	Test 4	
T, 12/6	Screening for Disease	Text Chapter 16
Th, 12/8	Article critique synopsis due and Course Conclusions	
FINAL	Section 1: W, December 14th, 8:00 – 10:30 am	

Clemson Department of Public Health Sciences Diversity Statement:

We believe diversity, inclusion and equity enrich the academic experience of our students, faculty, and staff, and prepare us to thrive in a global society. Thus, we are firmly committed to an environment that respects all members of our community. We will work to eliminate barriers that any members of our community experience. We accept personal and professional responsibility to eliminate bias and oppression wherever they are found. We understand our obligation to speak up when we see bias, whether in our teaching, study, or everyday life. We hold ourselves accountable for our actions and inactions, and for maintaining meaningful efforts to enhance diversity, inclusion and equity.

Student Accessibility Services:

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible, located in Suite 239 Academic Success Building (656-6848; sdsl@clemsion.edu).



Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: <https://www.clemson.edu/academics/studentaccess/>



Attendance Policy: (See Undergraduate Announcements)

Attendance is expected during class meetings. Please be respectful when you attend class of the instructor, yourself and your classmates, and leave non-course related activities (such as answering emails, text messaging, studying for other courses, etc.) until after class. Your participation is essential to course discussion, completion of assignments and success with examinations. Please let the instructor know as soon as possible, if you cannot attend one of the live class sessions during your assigned time.

Notification of Absence:

The Notification of Absence module in Canvas allows students to quickly notify instructors (via an email) of an absence from class and provides for the following categories: court attendance, death of immediate family member, illness, illness of family member, injury, military duty, religious observance, scheduled surgery, university function, unscheduled hospitalization, other anticipated absence, or other unanticipated absence. The notification form requires a brief explanation, dates and times. Based on the dates and times indicated, instructors are automatically selected, but students may decide which instructors will receive the notification.

This does not serve as an “excuse” from class. It is a request for an excused absence and students are encouraged to discuss the absence with instructors, as the instructor is the only person who can excuse an absence. If students are unable to report the absence by computer, they may reach the Office of Advocacy and Success via 864.656.0935. Students with excessive absences who need academic or medical assistance can also contact the Office of Advocacy and Success.

Academic Integrity (See Undergraduate Announcements)

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a high seminary of learning. Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of the learning experience and the Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form in this course.



When, in the opinion of a faculty member, there is evidence that a student has committed an act of academic dishonesty, the faculty member shall make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate dean for Curriculum in the Office of Undergraduate Studies. At the same time, the faculty member may, but is not required to, inform each involved student privately of the nature of the alleged charge. In instances where academic standards may have been compromised, Clemson University has a *responsibility* to respond appropriately and expeditiously to charges of violations of academic integrity. Please refer to the Academic Integrity Policy on the Clemson University website for additional information: <http://www.clemson.edu/academics/academic-integrity/index.html>

Clemson University Title IX (Sexual Harassment) statement:

Title IX Policy: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to 4 prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. The University is committed to combatting sexual harassment and sexual violence.

As a result, you should know that University faculty and staff members who work directly with students are required to report any instances of sexual harassment and sexual violence, to the University's Title IX Coordinator. What this means is that as your professor, I am required to report any incidents of sexual harassment, sexual violence or misconduct, stalking, domestic and/or relationship violence that are directly reported to me, or of which I am somehow made aware. There are two important exceptions to this requirement about which you should be aware: Confidential Resources and facilitators of sexual awareness programs such as "Take Back the Night and Aspire to be Well" when acting in those capacities, are not required to report incidents of sexual discrimination. Another important exception to the reporting requirement exists for academic work. Disclosures about sexual harassment, sexual violence, stalking, domestic and/or relationship violence that are shared as part of an academic project, a research project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX Coordinator. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>.

Emergency Guidelines from Clemson University Police Department (Please Read)

All students and employees should be familiar with the following guidelines. For additional information about safety see <http://www.clemson.edu/cusafety/preparedness/>.

Evacuation:

- When evacuating buildings, do not use elevators as they may lose power, stranding riders.
- Familiarize yourself with the locations of stairwells and exits.
- Individuals needing assistance evacuating should move to a stairwell away from the hazard, dial 911, and provide the Dispatcher with their exact location and what they need regarding evacuation.
- When evacuating follow the instructions provided by Public Safety personnel to reach a safe place.
- To seek “Tornado Safer Places,” get to the lowest level of the building time allows, stay away from areas with windows and glass, and put as many walls as you can between yourself and the outside. In public buildings, bathrooms typically have an additional wall.

Active Shooter:

- Always call 911 as soon as you possibly can.
- Run away from the area, if it is safe to do so, time allows and the gunman is not nearby.
- Hide if the gunman is too close to your location. Find a safer place, lock and barricade doors, turn lights out and cell phones off or to vibrate.
- Fight. As a last resort, resolve to fight the intruder with everything you have at your disposal.

A short video prepared and presented by the Department of Homeland Security can be found at the following link: dhs.gov/video/options-consideration-active-shooter-preparedness-video.



SACS Accreditation

Clemson University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award Bachelor’s, Master’s, Education Specialist, and Doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call at 404-679-4501 for questions about the accreditation of Clemson University.

CEPH Accreditation

In addition to SACS accreditation, the Department of Public Health Sciences is also accredited by the Council on Education in Public Health, <https://ceph.org/about/org-info/who-we-accredit/accredited/#baccalaureate>

The following public health domains are being covered in this course through the designated instructional strategies and assessment techniques.

CEPH Accreditation Public Health Domains	Instructional Strategy	Domain is covered/assessed
3. History and philosophy of public health as well as its core values, concepts, and functions across the globe and in society	Directed readings; lecture presentations; class discussions	Quiz and exam assessments
4. Basic concepts, methods & tools of public health data collection, use & analysis & why evidence-based approaches are an essential part of public health practice	Directed readings; lecture presentations; class discussions; practice exercises; independent research activity	Quiz and exam assessments; preparation of descriptive epi report
5. Concepts of population health, & the basic processes, approaches & interventions that identify & address the major health-related needs & concerns of populations	Directed readings; lecture presentations; class discussions; independent research activity	Quiz and exam assessments; review of subfields of epidemiology
6. Underlying science of human health & disease, including opportunities for promoting & protecting health across the life course	Directed readings; lecture presentations; class discussions; practice exercises	Quiz and exam assessments
7. Socioeconomic, behavioral, biological, environmental & other factors that impact human health & contribute to health disparities	Directed readings; lecture presentations; class discussions; self-directed study	Quiz and exam assessments; descriptive epi research activity
10. Basic concepts of legal, ethical, economic & regulatory dimensions of health care & public health policy & the roles, influences & responsibilities of the different agencies & branches of government	Directed readings; lecture presentations; class discussions	Quiz and exam assessments; course discussions
11. Basic concepts of public health-specific communication, including technical & professional writing & the use of mass media & electronic technology	Directed readings; small group discussions; preparation of summary reports	Article critique; descriptive epi research activity