

CLEMSON UNIVERSITY

Department of Public Health Sciences HLTH 3800 (001) Epidemiology

Spring 2020 Class Meeting Times: MWF 12:20 – 1:10 pm, Daniel 415

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)



Instructor: Dr. Deborah Falta, Ph.D., MPH
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Office Hours: MWF 1:15 – 2:15 pm; or by appt.

Important Dates:

Date	Event
F, 1/31	Test 1
M, 2/17	Test 2
M, 2/24	Class Descriptive Epi Activity
M & W, 3/9 & 3/11	Midterm Exam
W, 4/8	Test 3
W, 4/22	Article Critique Synopsis Due
M, 4/27	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
Unit II	Epidemiologic Measures of Disease & Association
Unit III	Epidemiologic Study Designs
Unit IV	Evaluating the Validity of an Epidemiologic Association
Unit V	Screening for Disease Prevention

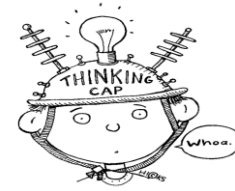
Learning strategies:

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

Grading:

1. Course 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 midterm exam and the final are 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 a SCANTRON form. 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 SCANTRON section of each exam will not be returned with graded exams. Therefore, if you wish to compare your graded SCANTRON sheet to these questions, you must do so within two weeks following the exam.** There is not much time available at the end of the semester to review SCANTRON-related sections for all the exams.



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.

2. Descriptive Epidemiologic Disease Distribution Research Activity

Students will research 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 in small groups on Monday, February 24th.



3. Group Epidemiologic Article Citations Activity

Working in a small group in class, students are expected to locate several peer-reviewed journal articles pertaining to a topic of their group’s choice. One article must describe a descriptive type of epidemiologic study. One article must describe an observational analytic epidemiologic study and the third identified article must describe an interventional or experimental type of epidemiologic study. Each identified study 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. 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 by the Friday following Spring Break.

4. 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 corresponding 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 Wednesday, April 22nd** 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!

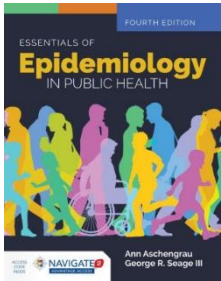
Your Course Grade will be determined in the following manner:

1. <u>Exams</u>	
Test 1	12.5%
Test 2	10%
Test 3	12.5%
Midterm	25%
Cumulative Final Exam	20%
2. Group Descriptive Epi Activity	5%
3. Group Epi Article Citation Activity	5%
4. Article Critique Synopsi	<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 in a course reader from Campus Copy Shop (189 Old Greenville Hwy A, above Amici's) and 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/>



DAY(S) & DATE (S)	TOPIC & CLASS ASSIGNMENTS	ASSIGNED READING (<i>italics indicates an optional reading assignment</i>)
W, 1/8	1 ST Class – Introduction to the course	
F, 1/10	Fundamental Approaches in Epidemiology	Text Chapter 1
M & W, 1/13 & 1/15	History of Epidemiology	Merrill (2017) Ch 2 (Canvas Module I) Stone (1996) Ch 2 (Canvas Module I)
F, 1/17	Conceptual Models of Disease Causation	<i>Semmelweis & Krieger articles</i> (Canvas Module I)
M, 1/20	Martin Luther King Jr. Holiday – no class	
W, 1/22	Ratios, Proportions & Rates	
F & M, 1/24 & 1/27	Measures of Disease Frequency	Text Chapter 2
W, 1/29	Mortality Measures	
F, 1/31	Test 1	<i>Bring pencil and calculator to class!</i>
M & W, 2/3 & 2/5	Rate Adjustment	Text pages 69-73
F - W, 2/7 – 2/12	Comparative Measures	Text Chapter 3
F, 2/14	Summary of Unit 2	
M, 2/17	Test 2	<i>Bring pencil and calculator to class!</i>
W, 2/19	E-learning Day! Sources of Health Data – refer to Canvas course materials	Text Chapter 4
F, 2/21	Descriptive Epidemiology	Text Chapter 5
M, 2/24	Class Descriptive Epi Research Activity	
W, 2/26	Overview of Epi Studies and Des Epi Study Designs	Text Chapter 6
F, 2/28	Experimental Studies & Ethics of Human Research	Text Chapters 7 & 17
M, 3/2	Cohort Studies	Text Chapter 8
W, 3/4	Case-Control Studies	Text Chapter 9
F, 3/6	Unit Conclusions	
M, 3/9	Part 1 of Midterm	<i>Bring pencil and calculator to class!</i>
W, 3/11	Part 2 of Midterm	<i>Bring pencil and calculator to class!</i>
F, 3/13	Group Epi Article Citations Bibliography Activity	
M – F, 3/16 – 3/20	SPRING BREAK	
M, 3/23	Internal Validity & the Role of Chance	Friis & Sellers, Ch 10 (Canvas Module 4) and Text Ch 12, pages 315-329
W & F, 3/25 & 3/27	Role of Bias	Text Chapter 10
M & W, 3/30 & 4/1	Role of Confounding	Text Chapter 11
F, 4/3	Effect Measure Modification	Text Chapter 13
M, 4/6	External Validity Considerations	Text Chapter 15
W, 4/8	Test 3	<i>Bring pencil and calculator to class!</i>
F, 4/10	Systematic Reviews	Lecture resources in Canvas Module 4
M, 4/13	Critical Review of Epidemiologic Articles	Text Chapter 14

DAY(S) & DATE (S)	TOPIC & CLASS ASSIGNMENTS	ASSIGNED READING (<i>italics indicates an optional reading assignment</i>)
W, 4/15	<i>Class workday for article critique activity</i>	
F & M, 4/17 & 4/20	Screening for Disease	Text Chapter 16
W, 4/22	Article critique synopsis due	
F, 4/26	Course Conclusions	
FINAL	Monday, April 27th, 8 – 10:30am	

Academic Continuity Plan for This Course

In the event the physical classroom facility becomes unavailable, as determined by the University's administration, class will be conducted in a virtual (online) format. The University issues official disruption notifications through email /www /text notification/social media. When notified, use one of the following links to navigate to Clemson Canvas where you will find important information about conducting class:

- Primary access link: www.clemson.edu/canva
- Secondary access link, if needed: <https://clemson.instructure.com/>
- You can also use the Canvas Student App.

On E-Learning Day, Feb. 19, 2020, a real-time test of the Academic Continuity Plan will be conducted. For further information, see the Academic Continuity Guide <https://clemson.app.box.com/s/8kpa22p36dvwavecr6avbfcykeeflmeo>, and the Academic Continuity webpage <http://www.clemson.edu/online/elearning/index.html>.



Attendance Policy: (See Undergraduate Announcements)

Attendance is expected at all 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.

If a student's use of a laptop during class lecture is reported to the instructor as distracting or disruptive, that student will no longer be allowed to use their laptop for the course. If the instructor has not arrived within 15 minutes of the scheduled beginning of the class, the students may leave. Exams are expected to be taken on the assigned, scheduled dates and written assignments turned in at the beginning of class on scheduled dates. Please notify the instructor in advance if you need an excused delay.

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.

Clemson University Title IX (Sexual Harassment) Statement:

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 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. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>.

**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 this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if possible, but there could be a significant wait due to scheduled appointments.

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: <http://www.clemson.edu/campus-life/campus-services/sds/>