

## Department of Public Health Sciences - HLTH 3800 Epidemiology

Fall Session II, 2020

**Course 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 with regard to 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.



**Course Rationale:** 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 validity. Students will also learn to judge whether an observed epidemiologic association may represent a truly causal relationship.



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**Course Pre-requisite:** Approved statistics course.



**Distance Learning Course:** This is an Internet course that will be taught via Canvas and Zoom. Readings, exams, and discussions will take the place of traditional lecture class times. Computer and Internet access, web access, video viewing access, PowerPoint, Word Processing program, speaker computer technology, and Clemson e-mail are necessary. You may need to download and install a media player, plug-in, or instant messaging application.



### **E-mail Correspondence:**

The instructor will respond to all inquiries, questions and other electronic correspondence within 48 hours. All e-mail messages from the instructor(s) will be sent to the students Clemson e-mail address.

**Netiquette Policy:** *Netiquette*, in short stands for *Internet etiquette*. Always practice netiquette when communicating electronically. Guidelines for netiquette include the following:

#### Be respectful of other participants.

- Don't post excessive messages that will take a long time to read and interpret.
- Everybody has an opinion. Keep your critiques constructive. Try not to offend anyone nor post antagonistic messages.
- Remember that you are communicating with people who do not have the advantage of seeing your body language or hearing inflections in your voice. This may cause misinterpretation of your message. For example, using all caps and exclamation marks may be interpreted as SHOUTING!!!
- When you communicate via technology, you should remember that any message you send can be saved or forwarded by its recipient. Chances are they are stored on a computer where you have no control. So, remember the old adage that mom used to say, "If you can't say something nice, don't say anything at all." Be professional and add quality information and external resources to your discussions.

## Learning Objectives:

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

- Describe the evolution of the field of epidemiology, the 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.



## Online Learning Modules:

Module 1    Introductory Epidemiologic Concepts & Measures

Module 2    Descriptive Epidemiology

Module 3    Epidemiologic Study Designs

Module 4    Evaluating the Validity of an Epidemiologic Association

Module 5    Screening for Disease Prevention

## Instructional Strategies:

- Text and supplemental readings
- Descriptive epi report & article critique activities
- Practice problems and examinations
- Recorded discussions of concepts, exercises and articles



## Assessments/Course Assignments:

### 1. Exams

Your grade in this course will be based primarily on 4 quizzes, a major midterm exam and a cumulative final, all administered through our course Canvas site using the Respondus Lockdown Browser and Monitor with a webcam. The Lockdown Browser is a secure browser for taking tests; it prevents students from printing, copying, going to another URL, or accessing other applications during a test. When a Canvas test requires that the LockDown Browser be used, students cannot take the test with a standard web browser. More information about using Respondus is available in the course Canvas space or Clemson's CCIT website.

The format for most exams will include a set of multiple choice, matching, and true/false questions, as well as a set of short-answer questions that involve employing disease causation concepts and epidemiological formulas. **Please note that your final exam counts for 15% of your grade, is CUMULATIVE in content, and is required of every student** (*i.e.* students with an A average may not exempt the final).



### 2. Descriptive Epidemiologic Report

**The objectives of this descriptive epidemiologic report are as follows:**

- To become familiar with various sources of data for the epidemiologic description of a health disorder
- To gain experience in describing and analyzing the distribution of a health disorder in a population using epidemiologic morbidity and mortality measures
- To enhance the ability to make sound epidemiologic judgments related to public health problems

**For this descriptive report project, select one of the following diseases (or you may study a different disease if you request and receive instructor approval):**

- HIV/AIDS
- Dengue Fever
- Stroke
- A Specific Type of Cancer
- *If you wish to choose **COVID-19**, please speak with the instructor regarding some data access concerns.*

## 2. Descriptive Epidemiologic Report (cont.)



Working independently or with a partner, **research** the distribution of the disease or health disorder that you have selected within a defined region (I suggest limiting your region, depending upon the nature of the disease you choose to study). Be sure to identify both rates of disease frequency and mortality!

**Compose** a report that summarizes the descriptive epidemiologic information that you have learned for your selected health disorder following this organization model:

1. **Define the health disorder**, including symptoms, disease prognoses, infectious type of agent, if appropriate, and the significance and reason for your selection of this health disorder.
2. **Summarize the distribution** of the selected health problem according to the following factors, using tables, graphs, or other illustrations wherever possible (*be sure to keep track of your resources responsibly!*):
  - A. Host characteristics (*who is sick and who isn't?*)
  - B. Environmental attributes (*where are there more or fewer cases?*)
  - C. Temporal variation (*have rates increased or decreased over time?*)
  - D. Any additional characteristics that contribute to an epidemiologic description of the disease's distribution
3. **Briefly summarize** any current hypotheses that have been proposed to explain the observed distribution, and list the principal gaps in knowledge about the distribution of the health problem.

Please strive to be neat and concise, typing as much of your report as possible. Be sure to organize your report using the model above and subheadings to clearly indicate which part of the assignment you are addressing. There is an Appendix at the end of text Chapter 4 that also provides guidance for this assignment. Be careful about referencing any source that you use for a table, graph, or figure which you have not created yourself. In fact, citing your sources of data is a major component of this assignment. **A copy of your report must be uploaded to Canvas for this assignment no later than Tuesday, November 3<sup>rd</sup>.**

### 3. Article Critique Activities

**The grade for this entire activity will be worth 15% of your overall grade and based on the following components:**

- 4 points – Part 1: Identification of concepts 1 – 3 for selected article
- 5 points – Part 2: Identification of concepts 4 – 6 for selected article
- 6 points – Summary formal critique

**Part 1:** During Module III, once we have begun discussing the various types of study designs utilized in epidemiologic research, please choose a peer-reviewed journal article from the list of articles available in our Canvas course. Read the article and try to identify the following three concepts:

- Context and Rationale for the Study (*Why was it done? Do not provide the hypothesis at this point! Try to understand the background and reason why the researchers decided to conduct this study!*)
- Research Hypothesis (*Clearly identify the exposure and health outcome being studied*)
- Epidemiologic Study Design Methodology (*Be sure to use epidemiologic concepts & terms! Identify the time period and location of the study, too.*)

**Share your ideas about these first three concepts with the instructor using the text box for Part 1 of the Critique available in the Assignments section of Canvas by the end of the day, Tuesday, November 24<sup>th</sup>.**



**Part 2:** Once we have discussed material from Module IV regarding internal and external validity, identify the following remaining characteristics in their selected article:

- Results of the Study (*Try to identify the key finding(s) in the study and do not feel you need to mention every little detail discussed in the article*);
- Issues of Interpretation for the Study (*Consider issues of internal validity, such as bias and confounding, associated with the study design – what did the researchers do to prevent any issues & what might have gone wrong?*); and
- Authors' Conclusions & Student's Personal Opinion regarding Significance of the Study (*here is a good place to mention "big picture" and external validity issues associated with the research*).

**This 2<sup>nd</sup> part of the article critique is due in Canvas by the end of the day, Sunday, November 29<sup>th</sup>.**

### 3. Article Critique Activities (cont.)

After students have received instructor feedback, a formal critique adhering to the following rubric will be due by the end of the day, **Wednesday, December 2nd**. **Be sure to use headings for each of the six concept sections!**

#### Final Critique Grading Rubric (Total Points = 6)

0- 0.5 pt – Discussion of context and rationale for study

0- 0.5 pt – Description of research hypothesis (clearly identified exposure and outcome of interest)

0-1 pt – 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 pt – Identification of key results (*identify most pertinent & significant findings & there is no need to review basic demographic characteristics of the study group*)

0-1.5 pts – Discussion of issues of interpretation (*internal validity assessment*)

0-1.5 pts – Review of authors' conclusions & student's personal opinion (*considering criteria for causality*) about "big picture" causation concepts

**Your course grade will be determined in the following manner:**

#### 1. Exams

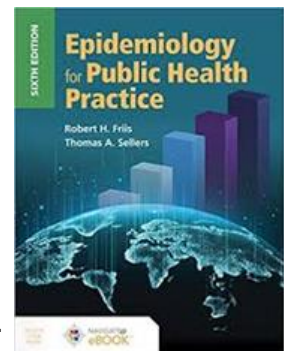
Quiz 1	5%
Quiz 2	10%
Quiz 3	10%
Midterm Exam	20%
Quiz 4	10%
Final Exam	15%

2. Descriptive Epidemiologic Report 15%

3. Article Critique Activities 15%

100%

**Grading Scale:**  
A = 90.0 - 100  
B = 79.5 - 89.9  
C = 69.5 - 79.4  
D = 62.0 - 69.4  
F = 61.9 or Below



#### **Course Textbook:**

RH Friis & TA Sellers. (2021). Epidemiology for Public Health Practice (6<sup>th</sup> Ed.). Jones & Bartlett Learning, Burlington, MA. ISBN: 978-1-284-17543-1

**Supplemental Resources:** A collection of additional readings and lecture slides are available digitally in our course's Canvas space. Refer to each Module for the location of its supplemental material, including practice exercises and solution guides.

## Course Schedule Fall Session II, 2020

### Important Deadlines:

Date	Event
M, 10/12	1st day of class
Su, 10/18	Quiz 1 due by end of the day
Su, 10/25	Quiz 2 due
T, 11/3	Descriptive Epi report due
Su, 11/8	Quiz 3 due
Su, 11/15	Midterm due
Su, 11/22	Quiz 4 due
T, 11/24	Part 1 of article critique due
Su, 11/29	Part 2 of article critique due
W, 12/2	Formal Critique due
M, 12/7	Final available and due by Noon, Th December 10 <sup>th</sup>

### Detailed Course Schedule & Assignments for Fall, 2020

Date	Module	Topics and Activities	Readings & Assignments
10/12 – 10/16 <i>(These dates are provided to help you pace yourself as you work through course materials!)</i>	1	<ul style="list-style-type: none"> <li>• Review syllabus</li> <li>• Access course in Canvas and familiarize yourself with the organization of course content</li> <li>• Review Respondus Lockdown Browser requirements &amp; take practice quiz</li> <li>• Fundamentals of Epidemiology</li> <li>• History of Epidemiology &amp; Disease Causation Theories</li> <li>• Infectious Disease Epidemiology</li> <li>• Disease Causation Conceptual Models</li> </ul>	<p>1) <b>Readings:</b></p> <ul style="list-style-type: none"> <li>- Text: Chapter 1, pages 50 - 60 in Chapter 2, and Chapter 12</li> <li>- Canvas Readings: Merrill Ch.1; Stone Ch. 2; optional articles by Krieger &amp; Semmelweis</li> </ul> <p>2) <b>Quiz 1:</b> due by end of the day, Sun. 10/18</p>
10/16 – 10/24	1	<ul style="list-style-type: none"> <li>• Ratios, Proportions &amp; Rates</li> <li>• Measures of Disease Frequency               <ul style="list-style-type: none"> <li>○ Prevalence</li> <li>○ Incidence</li> </ul> </li> <li>• Rate Adjustment</li> </ul> <p><i>Be sure to do all available practice problems and chapter review questions!</i></p>	<p>1) <b>Readings:</b></p> <ul style="list-style-type: none"> <li>- Text Chapter 3</li> </ul> <p>2) <b>Quiz 2</b> due by end of the day 10/25</p>
10/24 – 10/28	2	<ul style="list-style-type: none"> <li>• Descriptive Epidemiology</li> <li>• Health Data Sources</li> </ul>	<p>1) <b>Readings:</b></p> <ul style="list-style-type: none"> <li>- Text Chapters 4 and 5</li> </ul> <p>2) <b>Descriptive Epi Report</b> due by T, 11/3</p>



10/28 – 11/15	3	<ul style="list-style-type: none"> <li>• Overview of Epi Studies</li> <li>• Descriptive Epi Study Designs <ul style="list-style-type: none"> <li>○ Case Reports</li> <li>○ Ecological Studies</li> <li>○ Cross-Sectional Studies</li> </ul> </li> <li>• Measures of Association Concepts <ul style="list-style-type: none"> <li>○ Relative Measures</li> <li>○ Absolute Measures</li> </ul> </li> <li>• Analytic Epi Study Designs <ul style="list-style-type: none"> <li>○ Case-Control Studies</li> <li>○ Experimental Studies</li> <li>○ Cohort Studies</li> </ul> </li> </ul>	<p><b>1) Readings:</b></p> <ul style="list-style-type: none"> <li>- Text Chapter 6</li> <li>- Aschengrau &amp; Seage Ch 3 (in Canvas)</li> <li>- Text Chapters 7 – 9</li> </ul> <p><b>2) Quiz 3</b> due by end of the day Sun. 11/8</p> <p><b>3) Midterm Exam</b> due by end of the day Sun. 11/15</p>
11/15 – 12/2	4	<ul style="list-style-type: none"> <li>• Internal Validity <ul style="list-style-type: none"> <li>○ Chance</li> <li>○ Bias</li> <li>○ Confounding</li> </ul> </li> <li>• External Validity &amp; Causation</li> <li>• Systematic Reviews</li> <li>• Appraising the Epi Literature</li> </ul>	<p><b>1) Readings:</b></p> <ul style="list-style-type: none"> <li>- Chapter 10; Ch 2, pp. 72 – 83; Chapter 17 optional.</li> <li>- Aschengrau &amp; Seage Ch 10 – 13 (in Canvas)</li> </ul> <p><b>2) Quiz 4</b> due by end of the day Sun. 11/22</p> <p><b>3) Critique Activities:</b></p> <ul style="list-style-type: none"> <li>- <b>Part 1</b> T 11/24</li> <li>- <b>Part 2</b> Sun 11/29</li> <li>- <b>Formal Critique</b> 12/2</li> </ul>
12/2 – 12/11		<ul style="list-style-type: none"> <li>• Screening for Disease</li> </ul>	<p><b>Reading:</b></p> <ul style="list-style-type: none"> <li>- Text Chapter 11</li> </ul>
12/7 – 12/10		Cumulative Final due by Noon on Th 12/10	

**Public Health Sciences Diversity Statement:**

We strive to educate ourselves and others about the issues of a pluralistic society. We are committed to reaching beyond the views of individuals to value a community that appreciates and learns individuals' similarities and differences. Our department strives to create a safe environment that affirms the dignity and worth of everyone. We demonstrate this commitment by embracing differences, including those differences that are not visually apparent.

### **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@clemson.edu](mailto:sdsl@clemson.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 pertaining to online course instruction)

### **Response to a Presumptive Positive or Positive COVID-19 Test:**

Instructors and students who are informed that they have a presumptive positive diagnosis or have tested positive for COVID-19 should immediately self-isolate and submit the COVID-19 Positive Test Reporting Form (see University COVID-19 webpage). It will be up to the student to inform the instructor and students are directed to use the Notification of Absence module in Canvas to initiate this notification.



### **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/>. Ms. Alesia Smith is the Executive Director for Equity Compliance and the Title IX Coordinator. Her office is located at 223 Holtzendorff Hall, phone number is 864.656.3181, and email address is [alesias@clemson.edu](mailto:alesias@clemson.edu)

### **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](https://dhs.gov/video/options-consideration-active-shooter-preparedness-video).