EPI 2110 – Principles of Epidemiology
Summer 2019 (CRN 16119)

Graduate School of Public Health, University of Pittsburgh

Primary Instructor:

Thomas Songer, PhD, **MSc, MPH**, Dept. of Epidemiology
Office: 5118 Public Health **Email: tjs@pitt.edu**

Teaching Assistant:

Hannah Polglase, Dept. of Epidemiology, **e-mail: hap30@pitt.edu**

Purpose:

Epidemiology is a scientific discipline which seeks to identify and describe patterns of disease occurrence, identify determinants of disease, and evaluate disease prevention and health care treatment efforts. With its focus of study in human populations, epidemiology contributes important evidence-based information to public health research, policy, and practice. This core course is designed to introduce students to the fundamental definitions, terminology, concepts, methods, and critical thinking used in epidemiology. Particular attention will be given to the descriptive epidemiology activities that identify health patterns and their distributions in populations and analytical epidemiology activities that examine factors affecting health and health outcomes in populations. The material presented in this course will provide students with foundational knowledge to support future study and practice in public health activities.

CEPH MPH Competencies:

Content and instruction in this course are designed to allow students to attain competency and knowledge in two integral facets for practice in public health and community organizations as identified by the Council on Education in Public Health (https://ceph.org/assets/2016.Criteria.pdf). Specifically, these include:

C1. Apply epidemiologic methods to the breadth of settings and situations in public health practice.
K4: List major causes and trends of morbidity and mortality in the US or other communities relevant to the school or program.

Course Objectives:

The content of this course will permit students to apply epidemiology methods appropriately by developing specific knowledge and skills in epidemiology. More succinctly, students will be able to:

1. Apply and interpret the basic terminology and definitions of epidemiology.
2. Calculate and interpret basic epidemiology measures.
3. Identify key sources of data for evaluating a health issue in an epidemiologic context.

4. Describe a health issue in terms of its importance and the patterns that characterize its occurrence in the community.
5. Identify the principles and limitations of basic public health based screening programs.
6. Describe the process of identifying determinants of disease, disability, injury, or health care interventions.
7. Draw appropriate inferences from the results of epidemiologic studies investigating the determinants of disease, disability, injury, or health care interventions.
8. Recognize the role of age, gender, racial, ethnic, and cultural variability in epidemiologic data and results.
9. Evaluate epidemiologic evidence to formulate strategies and/or decisions on health issues in the community.

Course Structure:

The structure of the course is built around multiple modes of instruction to enhance understanding of the concepts of epidemiology and their application.

- On Tuesday and Thursday evenings, the instruction will be on an in-person format with the presentation of key lecture slides, discussion, and in-class response material. Students are expected to review the lecture slides prior to class to be aware of the fundamental objectives and material. Note: Only selected slides will be reviewed in the lecture. This will leave time for presentation of discussion points and response questions that focus on key material. Audio-recordings of the lecture slides will be available for those who wish to review material in further detail. Students are encouraged to read appropriate sections of the book for review of complex topics.
- The Audience Retrieval System app called "TopHat" will be used as a part of most lectures. This system will be used to gauge understanding of key lecture principles, to review key principles, and to provide practice questions to aid learning.
- Slide notes are available for each lecture to detail key points conveyed by individual slides. Students are encouraged to review posted slide notes and, if necessary, appropriate sections of the book for review of complex topics.
- Audio-recordings of the lecture slides will be available for those who wish to review material in further detail, or if you are unable to attend a class session. Note: These recordings are from an earlier course offering, and some of the slides have changed slightly over time.
- Practice questions will be posted in Courseweb for each lecture to provide further examples relevant to the lecture material. Students are expected to review this material and the posted answers to identify their strengths and weaknesses on the related concepts.
- Homework assignments will be used in the course to support key lecture principles. Answers to the assignments will be posted after the due date. Students are expected to review the posted answers to identify their strengths and weaknesses on the related concepts. If a weakness is identified, the student is encouraged to address it through discussions in the recitation, or through discussions with the teaching assistant or professor during office hours.
- In addition, we will be using the time from 6:30 to 7:00 pm on Tuesdays and Thursdays as a recitation period for the review of basic lecture concepts, practice questions and discussion related to the class. Attendance in this learning period is not required, but your attendance is encouraged, particularly if you identify weaknesses in your understanding of the material.

Course Requirements:

The following requirements pertain to this course.

Participation in **assessments/responses during class** will be included in the course. This activity will occur on an ongoing basis in the course using the TopHat app and an occasional paper handout. The purpose of these short assessments is to allow all participants to gauge their level of understanding and recognition of key lecture material. The assessment/responses will not be strictly graded, but under the academic integrity code, students should attempt to answer on a "good faith attempt" basis.

Participation in **TopHat assessments during class** will be an integral part of instruction in this course. The purpose of these short assessments is to allow all participants to gauge their level of understanding and recognition of key lecture material. The responses provided by students will not be graded, but under the academic integrity code, students should attempt to answer on a goof faith attempt basis. These exercises will require students to attend class on a regular basis. Students may miss up to 3 assessments during the course without penalty. Missed assessments exceeding this limit will result in a reduction in grade by 0.5 points per assessment.

Completion of **homework assignments** will be required to facilitate learning of the more rigorous concepts presented in the course. The assignments will pertain to lecture-specific topics and will generally cover issues that require quantitative and critical thinking skills. Please consult the schedule at the end of this syllabus to identify the assignments and their due dates for receipt. You should return the homework assignments through Courseweb by using the link provided with the assignment.

Homework exercises will be graded. Selected questions in each assignment will be checked in this grading process. Answer keys for the homework assignments will be posted after the assignment is due. It is your responsibility to review your assignment and the answer key to identify areas of strength and weakness in the assignments. Help to address an identified weakness can then be obtained by utilizing the recitation period, and/or through questions directed to the instructor or teaching assistant. **A one point deduction penalty will be given if an assignment is turned in late** (unless prior arrangements have been made).

Seven quizzes will be given during the course to formally assess your level of knowledge of the material. The short quizzes will be seven questions in length and given through online testing. Each quiz will be structured to include 4 questions of average rigor, 2 questions of moderate rigor, and 1 question of higher order thinking. The instructor will identify the content areas for each quiz in the lectures prior to its administration. Specific dates of these quizzes are listed in the schedule included at the end of this syllabus.

Three exams will be given during the course to evaluate the level of mastery of the material presented. The first exam on June 11 will be given in A115 Crabtree Hall from 5pm to 7pm. The second exam will be given on July 11 in the same room and at the same time. The third exam will take place in A115 Crabtree Hall on August 1. The third exam on August 1 will cover material from the entire semester, but will largely focus on material from the last five lectures. Students will be allowed to use notes and the textbook during all exams. Remember, also, to bring a working calculator to these exams. Laptops and phones will not be permitted for any exam. There are no make-up exams except under **EXTREME** circumstances (i.e. death in the family).

The exams will be comprised of a variety of question formats. Essay-type questions will query your ability to problem solve and apply the lecture material to relevant health scenarios. Short answer and

multiple choice questions will assess your recognition of key lecture topics and their application. In addition, some questions will also contain epidemiological problems requiring calculations. The purpose of each of the exams will be to evaluate how well the student understands the concepts of epidemiology, why certain actions are done in epidemiology, and specific details of epidemiologic approaches and methods. This means that, in many circumstances, you will be required to think and state how epidemiology applies to a given situation, or to identify which given example is the best representation of epidemiology principles. These exams are based on critical thinking and not on memorization. Students who are successful on the exams prepare as if these exams are closed book.

Grading Policy:

Course requirements will be weighted in the following fashion to determine the final course grade.

In-class responses	12%	
Homework Exercises:	10.5%	(1.5% each)
Quizzes:	17.5%	(2.5% each)
Exams:	60%	(20% each)

Grades will be assigned using a letter grade as follows:

A:	90% or higher
B:	80% to < 90%
C:	70% to < 80%
F:	< 70%

Students who withdraw from the course must verify that they have been removed from the class roster maintained by the University Registrar. Otherwise, students who remain on the roster and do not complete the designated work will be assigned a failing grade.

Course Expectations

As a student in this course, you can expect the following:

Epidemiology is a unique discipline that utilizes a blend of quantitative and qualitative skills and abilities to address important health issues in the community. In epidemiology, heavy emphasis is placed upon describing the importance of health issues through quantitative measures where there are correct and incorrect methods to identifying answers. However, in epidemiology, a professional must also be able to interpret this quantitative information in the context of the community and accepted practices. This interpretation involves the use of critical thinking skills. It is often the case that there can be more than one correct answer to the proper interpretation of a health related issue. However, a professional must choose among various options to identify a best response (i.e. a solution that is the most appropriate for the problem posed given the information available). **Acquiring the knowledge and skills to make reasoned judgments is one objective of this course**. For many students, this will be their first experience in making judgments where there is not one right or wrong answer. As a result, some students may become discouraged, especially if their interpretations are marked off on exams and lose points. Be patient and keep on trying. Making reasoned judgments takes time and practice.

This course is a required course for most students in the Graduate School of Public Health. As a result, it contains students from many different cultures and backgrounds and with many different levels of

understanding and expertise. You may hear responses during the class that are not readily apparent to you, as someone may be presenting a response from their area of expertise. Be prepared to add to this discussion from your own area of background or to ask for clarification in these situations. Let's take advantage of the diversity in our class to learn epidemiology.

The graduate nature of this class also means that there is the expectation that students will monitor their academic progress and seek help when necessary. Suggested answers to practice exercises and homework assignments will be posted as part of the course material for each lecture. Students are expected to review this material and their own completed work to independently assess their level of understanding of the material. If questions still remain, students should seek input from the teaching assistant or instructors during office hours or the recitation periods.

Recommended Text:

Epidemiology, 4th edition, Gordis (2009), Elsevier/Saunders Company (ISBN: 978-1-4160-4002-6).
-purchase only, available online

Epidemiology, 5th edition, Gordis (2014), Elsevier/Saunders Company (ISBN: 978-1-4557-3733-8).
-purchase online
-available as an electronic book (no purchase required) at the Health Sciences Library website
http://www.hsls.pitt.edu/resources/books/ebooks?s=Epidemiology

Office Hours:

Instructor:

Dr. Songer: Fridays, 2:45 - 4:00 pm, Starbucks Coffee, Fifth Avenue (Amos Hall)

Teaching Assistants:

Ms. Polglase: Tuesdays, Thursdays, 3:30 – 4:30 pm, GSPH Commons Lounge

Course Website:

All course materials can be accessed through the Courseweb software application used at the University of Pittsburgh (http://courseweb.pitt.edu). All enrolled students have online access to this content. Class materials on this system can be accessed through the **Course Documents** link. The basic structure of the Course Documents link is built around lecture modules. Several different types of materials will be provided in each module, including lecture slides, an audio recording to describe the slides, assigned reading in the required textbook, class handouts, a practice exercise to assess your understanding, and, where applicable, required homework assignments. All quizzes will be posted under the **Quiz** link in Courseweb. Finally, all announcements related to the course will be posted using the Courseweb announcement system. You will be expected to monitor Courseweb regularly for these announcements. If changes occur in the course, they will be broadcast through this mechanism.

Academic Integrity:

All students are expected to adhere to the school's standards of academic honesty. Cheating/plagiarism will not be tolerated. Any piece of individual work submitted by a student for evaluation must represent his/her own intellectual contribution and efforts.

The Graduate School of Public Health's policy on academic integrity, which is based on the University policy, is available online in the Pitt Public Health Academic Handbook (http://www.publichealth.pitt.edu/home/academics/academic-requirements). The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

Students committing acts of academic dishonesty, including plagiarism, collaboration on exams, cheating on in-class exams, misrepresentation of data, and facilitating dishonesty by others, will receive sanctions appropriate to the violation(s) committed. Sanctions include, but are not limited to, reduction of a grade for an assignment or exam, failure of an exam, and failure of the course.

All student violations of academic integrity will also be documented and forwarded to the Graduate School of Public Health Office of Student Affairs. If a sanction for a violation is agreed upon by the student and instructor, then the document of violation will be expunged from the student file upon the student's graduation. If the sanction proposed by the instructor is not agreed upon by the student, then the violation will be referred to the GSPH Academic Integrity Hearing Board, where a final decision on the violation will be rendered. However, the document of the academic violation and the final decision of the Hearing Board will remain in the student's permanent record.

Disability Resources and Services:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both Dr. Songer and Disability Resources and Services (DRS), 140 William Pitt Union, Phone: (412) 648-7890, drsrecep@pitt.edu, (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. A comprehensive description of the services of that office can be obtained at https://www.studentaffairs.pitt.edu/drs/.

Students that require accommodations in the event of a building evacuation should e-mail the Office of Environmental Health and Safety (EHS) at safety@ehs.pitt.edu to request the development of an individualized evacuation plan. When finalized, you should also inform Dr. Songer of the proposed plan for an evacuation.

Posted Audio Recordings and Classroom Recording Policy:

Audio recordings of the lectures are provided in Courseweb under the respective lecture folders to assist students on course material that may be confusing or covered quickly. Note, the audio files represent discussion and slides presented in a prior term. While the material in the recordings is similar to that presented this year, it will differ in some instances, as new material has been added. Be aware that you will be assessed on material as it is presented in the current year lectures.

Given that recordings are already provided for each lecture, and to ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance

written permission of the instructor. Also, any properly approved recording can be used only for private use or for use by all other students enrolled in the class. Recordings may not be copied, distributed, published, or used in another fashion without the written consent of the instructor. A copy of any approved recording may also be requested by the instructor.

Sexual Misconduct, Required Reporting and Title IX Statement:

The University is committed to combatting sexual misconduct. Faculty are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that appropriate resources and support options may be provided. What this means is that as your professor, I am required to report any incidents of sexual misconduct that are directly reported to me, or of which I am made aware.

There are two important exceptions to this requirement where disclosures are not required to be reported to the University's Title IX office:

1. An exemption to reporting exists for a disclosure about sexual misconduct that is shared as part of an academic project, classroom discussion, or course assignment.
2. An exemption to reporting exists for disclosures made to designated university employees who can maintain confidentiality related to the care of students. These employees primarily include counselors and medical professionals. A list of employees who do not have the reporting responsibility can be found at https://www.titleix.pitt.edu/report/confidentiality.

If you are the victim of sexual misconduct, you may reach out to these resources; the Title IX Office, Phone: 412-648-7860, or the Office of Sexual Harassment and Assault Response and Education (SHARE), Phone: 412-648-7930 (8:30 a.m. to 5 p.m.; M-F) or 412-648-7856 (after business hours). If you have a safety concern, please contact the University of Pittsburgh Police, Phone: 412-624-2121.

Diversity Statement:

Pitt Public Health considers the diversity of its students, faculty, and staff to be a core strength of its educational mission. Pitt Public Health is committed to creating and fostering inclusive learning environments that value human dignity and equity. Every member of our community is expected to be respectful of the individual perspectives, experiences, behaviors, views, and backgrounds of others. While intellectual disagreement may be constructive, no derogatory statements, or demeaning or discriminatory behavior will be permitted. If you feel uncomfortable or would like to discuss a situation, you may contact the following resources; (1) the course instructor, (2) the Pitt Public Health Associate Dean for Diversity, Phone:412-624-3506, E-mail:nam137@pitt.edu, or (3) the University's Office of Diversity and Inclusion, Phone: 412-648-7860, Internet: https://www.diversity.pitt.edu/make-report/report-form (anonymous reporting form).

Lecture, Exam, and Assignment Schedule:

Date	Instructor	Class Session/Topic
May 14	Songer	**Introduction & Historical Overview of Epidemiology** Reading: Textbook (Gordis, 4th Ed.): Chapter 1 Textbook (Gordis, 5th Ed.): Chapter 1 LaMorte WW. The Evolution of Epidemiologic Thinking. Available at: http://sphweb.bumc.bu.edu/otlt/mph-modules/ep/ep713_history/EP713_History3.html
May 16	Songer	**Epidemiologic Approach to Disease I; Person, place, time/Host, agent, environ** Reading: Textbook (Gordis, 4th Ed.): Chapter 2 (pgs. 19-20, 29-32) Textbook (Gordis, 5th Ed.): Chapter 2 (Introduction, Exploring Occurrence of Disease), Chapter 16 (Time Trends in Disease, Migrant Studies)
May 21	Songer	**Epidemiologic Approach to Disease II; Assessing disease in populations** Reading: Textbook (Gordis, 4th Ed.): Chapters 2, 6 (pgs. 20-22, 109-110) Textbook (Gordis, 5th Ed.): Chapter 2 (Clinical and Subclinical Disease) Textbook (Gordis, 5th Ed.): Chapter 6 (Introduction) Online Quiz 1 posted (due May 23)
May 23	Songer	**Heterogeneity in Populations and the Dynamics of Infectious Disease** Reading: Textbook (Gordis, 4th Ed.): Chapter 2 (pgs. 19-20, 22) Textbook (Gordis, 5th Ed.): Chapter 2 (Modes of Transmission, Incubation Period, Carrier Status)
May 28	Songer	**Infectious Disease Prevention and Outbreak Investigation** Reading: Textbook (Gordis, 4th Ed.): Chapter 2 (pgs. 22-28, 28-29, 32-35) Textbook (Gordis, 5th Ed.): Chapter (Endemic, Epidemic, and Pandemic, Herd Immunity, Disease Outbreaks, Attack Rate, Outbreak Investigation) Torok M. Epidemic Curves Ahead. Focus on Field Epidemiology, Vol 1(5):pgs. 1-6. Available at: https://nciph.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_issue.pdf Online Quiz 2 posted (due May 30) Homework Assignment given out (due June 4)
May 30	Songer	**Epidemiology in Global Contexts/Epidemiologic Transition/Chronic Disease Epidemiology** Reading: Textbook (Gordis, 4th Ed.): Chapter 1, 4, 19 (pgs. 4-6, 79-81, 333-335) Textbook (Gordis, 5th Ed.): Chapter 4 (Projecting the Future Burden of Disease) Textbook (Gordis, 5th Ed.): Chapter 19 (Epidemiology and Prevention) Omran AR. The Epidemiologic Transition. Excerpted in The Bulletin of the WHO, 2001, 79(2). Available at http://ocw.uci.edu/upload/files/v79n2a11.pdf Homework Assignment given out (due June 6)
June 4	Songer	**Identifying Disease in the Community; Surveillance Approaches** Reading: Textbook (Gordis, 4th Ed.): Chapters 3, 4 (pgs. 54-55, 70-73) Textbook (Gordis, 5th Ed.): Chapter 3 (Surveillance, Active and Passive) Textbook (Gordis, 5th Ed.): Chapter 4 (Problems with Mortality Data) Online Quiz 3 posted (due June 6)
June 6	Songer	**Measures of Disease Frequency; Incidence, Prevalence, Clinical Measures** Reading: Textbook (Gordis, 4th Ed.): Chapter 3 (pgs. 37-54), Chapter 17 (pgs. 293-299) Textbook (Gordis, 5th Ed.): Chapter 17 (Studies of Outcome, Efficacy, Effectiveness, Efficiency, Measures of Outcome, Outcomes Research) Homework Assignment given out (due June 13)

June 11	---	Exam 1
June 13	Songer	**Measures of Disease Frequency; Mortality/Prognosis of Disease** Reading: Textbook (Gordis, 4th Ed.): Chapters 4, 6 (pgs. 59-73, 109-13) Textbook (Gordis, 5th Ed.): Chapter 4 (Measures of Mortality) Textbook (Gordis, 5th Ed.): Chapter 6 (Case Fatality, Person Years)
June 18	Songer	**Measures of Disease Frequency; Standardization/Survival** Reading: Textbook (Gordis, 4th Ed.): Chapter 4 (pgs. 73-79), Chapter 6 (pgs. 112-129) Textbook (Gordis, 5th Ed.): Chapter 4 (Comparing Mortality in Different Populations) Textbook (Gordis, 5th Ed.): Chapter 6 (Survival, Life Tables, Kaplan-Meier) Online Quiz 4 posted (due June 20) Homework Assignment given out (due June 25)
June 20	Songer	**Measures of Disease Association; Relative risk, Odds ratio** Reading: Textbook (Gordis, 4th Ed.): Chapter 11 Textbook (Gordis, 5th Ed.): Chapter 11 Homework assignment given out (due June 27)
June 25	Songer	**Analytical Epidemiology; Hypotheses, research designs and sequence** **- descriptive designs, ecologic designs** Reading: Textbook (Gordis, 4th Ed.): pgs. 165-66, 227-30, 234-35, 333-35 Textbook (Gordis, 5th Ed.): Chapter 14 (Approaches for Studying Disease Etiology, Types of Causal Relationships), Chapter 10 (Ecologic Studies), Chapter 19
June 27	Songer	**Analytical Epidemiology; Cross-sectional/Case-control designs** Reading: Textbook (Gordis, 4th Ed.): Chapter 10 (pgs. 195-98, 177-95) Textbook (Gordis, 5th Ed.): Chapter 10 (Case-Control, Cross-Sectional Studies) Quiz 5 posted (due July 2)
July 2	Songer	**Analytical Epidemiology; Case-crossover/Cohort designs** Reading: Textbook (Gordis, 4th Ed.): Chapter 9 Textbook (Gordis, 5th Ed.): Chapter 9, Chapter 10 (Case-Crossover Design) Homework assignment given out (due back July 9)
July 4	---	No class – Holiday
July 9	Songer	**Analytical Epidemiology; Randomized clinical trials** Reading: Textbook (Gordis, 4th Ed.): Chapter 7 Textbook (Gordis, 5th Ed.): Chapter 7, Chapter 8 (Ethical Considerations)
July 11	---	Exam 2
July 16	Songer	**Error in Epidemiologic Studies I; Chance, Bias** Reading: Textbook (Gordis, 4th Ed.): Chapters 8, 10, 15 (pgs. 147-52, 187-88, 247-251) Textbook (Gordis, 5th Ed.): Chapter 8 (Sample Size, Generalizability of Results) Textbook (Gordis, 5th Ed.): Chapter 10 (Information Bias), Chapter 15 (Bias)
July 18	Polglase	**Error in Epidemiologic Studies II; Confounding, effect modification** Reading: Textbook (Gordis, 4th Ed.): Chapters 14, 15 (pgs. 230-34, 251-261) Textbook (Gordis, 5th Ed.): Chapter 14 (Types of Associations) Textbook (Gordis, 5th Ed.): Chapter 15 (Confounding, Interaction) Homework Assignment given out (due back July 23)

July 23	Songer	**Assessing the Quality of Epidemiologic Research** Reading: Vance DE, Talley M, Azuero A, et al. Conducting an Article Critique for a Quantitative Research Study. *Nursing: Research and Reviews* 3:67-75, 2013 Online Quiz 6 posted (due back July 25)
July 25	Songer	**Inference from Epidemiologic Studies/Causal Models** **Measures of Effect; Assessing Public Health Impact** Reading: Textbook (Gordis, 4th Ed.): Chapter 12, Chapter 14 (pgs. 236-45) Textbook (Gordis, 5th Ed.): Chapter 8 (Expressing the Results of RCTs), Chapter 12, Chapter 14 (Types of Causal Relationships, Evidence for a Causal Relationship)
July 30	Songer	**Epidemiology in Practice; Screening; validity, application and bias** Reading: Textbook (Gordis, 4th Ed.): Chapters 5, 18 Textbook (Gordis, 5th Ed.): Chapters 5, 18 Online Quiz 7 posted (due back August 1)
August 1	--	Exam 3