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PUBH 8133 01P - Epidemiologic Methods

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Georgia Southern University
Jiann-Ping Hsu College of Public Health

PUBH 8133 – Epidemiologic Methods
Section 01P
CRN: 14547

Spring 2015

<u>Instructor:</u>	Yelena N. Tarasenko, DrPH, MPH, MPA
<u>Office Address:</u>	Jiann-Ping Hsu College of Public Health 501 Forest Drive, Hendricks Hall Building 303, Office 2012 Statesboro, GA 30458
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<u>E-Mail Address:</u>	ytarasenko@georgiasouthern.edu
<u>Office Hours:</u>	Wednesday 12:00 pm – 2:00 pm and Friday 9:00 am – 12:00 pm (outside office hours: by appointment)
<u>In-Class Meetings:</u>	1:00 pm – 4:00 pm on Fridays: January 16 th , Feb 13 th , March 13 th , April 17 th in Hendricks - classroom 3001

Course Prerequisite

Enrollment into the DrPH Program, Introduction to Epidemiology, basic experience in the use of the personal computer and statistical software, or permission of the instructor

Catalog Description:

An advanced epidemiology course designed to reinforce epidemiological concepts, as well as build a foundation for epidemiologic research in public health practice. Specific course content includes observational and experimental epidemiologic research methods. Emphasis will also be placed on appropriate analytic techniques necessary for biostatistical inference. (GSU Graduate Catalog)

Required Texts:

Epidemiology

Moyses Szklo, Johns Hopkins School of Public Health; Javier Nieto, University of Wisconsin Medical School

Publisher: Jones & Bartlett Learning;

Copyright year: © 2014 Pages: 516

ISBN-10 1-284-02782-1 ISBN-13 978-1-284-02782-2

Coursesmart: http://www.coursesmart.com/IR/5901559/9781284027822?_hdv=6.8

Readings from journal articles, manuscripts, and other materials, listed in the daily assignments posted online or distributed in class.

Recommended (Optional) Textbooks:

Elwood Mark. *Critical Appraisal of Epidemiologic Studies & Clinical Trials*. Third Edition. Oxford University Press. 2007.

Kelsey, J.L., Thomson, W.D. and Evans, A.S. *Methods in Observational Epidemiology*. Oxford University Press, New York. 1996. [Very useful explanations of issues involved in case-control, retrospective, and prospective studies. A good discussion of matching, stratification, and design issues.]

Epidemiology Core Competencies:

1. Evaluate the existence of public health problems in rural and urban settings, both locally and internationally.
2. Analyze data from epidemiologic investigations, studies, and surveillance, with special emphasis on the identification of health disparities and promotion of health equity.
3. Evaluate causal inferences from epidemiologic data.
4. Evaluate the validity and reliability of public health screening programs.
5. Evaluate the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.
6. Synthesize principles of good ethical and legal practice pertaining to the collection, maintenance, use and dissemination of data.
7. Apply current knowledge of disease etiology for use in guiding public health practice.
8. Evaluate the effects of determinants of health on public health practice.
9. Design investigations of acute and chronic health conditions or other adverse outcomes using languages and approaches tailored to the targeted population or community.
10. Evaluate public health programs at the global, national, regional, state, local, or tribal level.
11. Recommend use of laboratory resources to support epidemiologic activities.
12. Apply principles of informatics, including data collection, processing, and analysis, in support of public health practice.
13. Communicate epidemiologic information to lay and professional audiences.
14. Evaluate the strengths and limitations of epidemiologic research findings.
15. Recommend evidence-based interventions and control measures in response to epidemiologic findings.

Course Objectives (Linked to the Concentration Competencies):

1. Differentiate between epidemiologic study designs and assess their relative strengths. (Competencies 3, 1)
2. Understand the multiple approaches to measuring disease frequency, association, and impact and which measures are applicable to various study designs. (Competencies 1, 2, 4, 8, 9, 10)
3. Evaluate the potential for confounding and interaction in epidemiologic data and understand several approaches for addressing these validity issues in epidemiologic research. (Competencies 14, 15)
4. Perform and interpret stratified analysis of epidemiologic data for point and interval estimation of measures of association for typical study designs. (Competencies 2, 3)
5. Be familiar with the interpretation, strength, limitations, and assumptions associated with using various statistical modeling procedures for the analysis of epidemiologic data.
6. Evaluate epidemiologic literature in a systematic and critical manner in assessing the “state-of-the science” and appreciate the issues associated with sample size estimation and the precision of estimates in the design and evaluation of epidemiologic research. (Competencies 4-10, 13, 14)

Summary of Important Dates:

Topic Assignment	Date
Response to my “welcome” message posted in Folio.	By January 16
Problem Set # 1	February 9
Problem Set # 2	March 2
Midterm Exam (in-class)	March 13
Problem Set # 3	March 30
Problem Set # 4	April 20
Data Project	April 27
Final Exam (online)	May 1

Date	Topic Assignment	Reading Assignments
Module 1 1/12 – 1/16	Introduction to Epidemiologic Methods/Orientation/Review/Causality Meet online <u>weekly</u> with Teaching Assistant, Adam Middleton. Thursday, January 15th at 6:00 PM. IN-CLASS LECTURE	<ul style="list-style-type: none"> ▪ Please see the “welcome” message posted online. ▪ Rothman KJ. Causes. American Journal of Epidemiology. 1976; 104:587-592. ▪ Hofler M. The Bradford Hill considerations on causality: a counterfactual perspective. Emerging Themes in Epidemiology. 2005; 2:11. ▪ Chapter 10 Szklo. ▪ Optional: Taubes G. Epidemiology faces its limits. Science. 1995; 269: 164-9.
Module 2 1/16 – 1/23	Issues in the Design of Epidemiologic Studies	<ul style="list-style-type: none"> ▪ Chapter 1 Szklo. ▪ Wacholder S, McLaughlin JK, Silverman DT, Mandel JS. Selection of controls in case control studies. I. Principles. American Journal of Epidemiology. 1992; 135:1019-1028. ▪ Saldana T, Basso O, Darden R and Sandler D. Carbonated Beverages and Chronic Kidney Diseases. Epidemiology. July 2007; 501-501.
Module 3 1/23 – 1/30	Measurement of Disease Occurrence	<ul style="list-style-type: none"> ▪ Chapter 2 Szklo. ▪ Schoenbach V. Measuring Disease and Exposure.
Module 4 1/30 – 2/6	Measurement of Association	<ul style="list-style-type: none"> ▪ Chapter 3 Szklo. ▪ Zhang J and Yu KF. What’s the relative risk? A method for correcting the odds ratio in cohort studies common outcomes. JAMA.1998; 280: 1690-1691.
Module 5 2/6 – 2/13	Bias (Selection and Information) Problem Set #1 Due 2/9 IN-CLASS LECTURE	<ul style="list-style-type: none"> ▪ Chapter 4 Szklo. ▪ Morabia A. Case control studies in clinical research: mechanism and prevention of selection bias. Preventive Medicine. 1997; 26(5 Pt 1):674-677.
Module 6 2/13 – 2/20	Analysis I: Stratified Analysis and Confounding	<ul style="list-style-type: none"> ▪ Chapter 5 Szklo. ▪ Greenland S, Morgenstern H. Confounding in health research. Annual Rev Public Health.

		<p>2001;22:189-212.</p> <ul style="list-style-type: none"> Additional materials posted online or distributed in class.
Module 7 2/20 – 2/27	Analysis II: Trends for Rates, Ecologic Studies	<ul style="list-style-type: none"> Rosenberg D. Trend analysis and interpretations. Morgenstern H. Ecologic studies in epidemiology: concepts, principles, and methods. Annual Review of Public Health.1995; 16: 61-81.
Module 8 2/27 – 3/6	<p>Analysis III: Interaction Assessment</p> <p>Problem Set #2 Due 3/2</p>	<ul style="list-style-type: none"> Chapter 6 Szklo Tuut M. and Hense HW. Smoking, other risk factors and fibrogen levels: evidence of effect modification. AEP 2001; 11(4): 232-238.
Module 9 3/6 – 3/13	<p>Sample Size Estimation/ Study Implementation</p> <p>IN-CLASS MIDTERM EXAM</p>	<ul style="list-style-type: none"> Chapter 8 Szklo Sample size readings to be posted/distributed in class. Data management and analysis readings to be posted/distributed in class.
Module 11 3/20 – 3/27	Multivariable Analysis	<ul style="list-style-type: none"> Chapter 7 Szklo Greenland S. Modeling and variable selection in epidemiologic analysis. American Journal of Public Health. 1989; 79(3): 340-349.
Module 12 3/27 – 4/3	<p>Logistic Regression</p> <p>Problem Set #3 Due 3/30</p>	Kleinbaum D. Chapter 1. Introduction to logistic regression. In Logistic Regression: A Self-Learning Text -- to be distributed/posted online.
Module 13 4/3 – 4/10	Logistic Regression II	Kleinbaum D. Chapter 6. Modeling strategy guidelines. In Logistic Regression: A Self-Learning Text -- to be distributed/posted online.
Module 14 4/10 – 4/17	<p>Review</p> <p>IN-CLASS LECTURE</p>	Review.
Module 15 4/17 – 4/24	<p>Problem Set #4 Due 4/20</p> <p>Data Project Due 4/27</p>	Apply knowledge and developed on skills on logistic regression.
5/1	Final Exam (Online)	Review the entire course material.

The lecture schedule is subject to change depending on the schedules of the faculty, as well as perceived need to make the most out of the few in-class meetings. Students will be given notice in the event that a change needs to be made to the schedule.

Samples of your work may be reproduced including, but not limited to, inclusion in the professor's teaching portfolio. You have the right to review anything selected for use, and subsequently ask for its removal.

Instructional Methods:

This doctoral course is offered in a hybrid format: it will meet 4 times during the semester (please see aforementioned times), while the rest of the course will be delivered online using the Folio system. Homework assignments, midterm and final examination, and data project constitute the basis of student evaluation. Students are expected to make use of instructor's office hours and in-class meetings to discuss concepts or difficulties they may have.

Online Sessions:

Because this class is offered in a hybrid format, weekly online sessions will be held on Folio with the Teaching Assistant, Adam Middleton. These sessions will be a review of the material in the modules and give the students an opportunity to ask questions about the problem sets and receive clarification on any material. **The online sessions will take place each week on Thursday at 6:00 PM. The online session will meet the first week on January 15th to review basic definitions and concepts of epidemiology.** Adam Middleton can also be reached throughout the week through email (am02658@georgiasouthern.edu) and will hold his own office hours on campus in Room 1027 in Hendricks Hall. Attendance in these online sessions and meeting with Adam will count towards your class participation grade for the course. If you are unable to attend the online sessions, arrangements must be made in advance with the teaching assistant in order to receive participation credit.

Evaluation:

Your final course grade will be assigned according to the following.

- A (100% – 90%; 900 – 100 points) – high achievement;
- B (89% – 80%; 800-899 points) – satisfactory achievement;
- C (79% – 70%; 700 – 799 points) – minimum passing grade; Failing grade ($\leq 69\%$; ≤ 699 points)

Course grades will be based upon evaluation of the following activities:

Assignments and Tests	Points
Mid-term examination (in class)	155
Problem Sets (4)	400
#1 Measures of frequency and association	100
#2 Case control, confounding, and other biases	100
#3 Interaction assessment	100
#4 Multiple logistic regression	100

Applied data analysis project	200
Class participation (10 points class attendance, 30 points online sessions)	40
Final exam	205
TOTAL	1000

Midterm Exam: There will be an in-class mid-term exam on **March 13th**. The exam will emphasize material covered in the assigned readings, posted online materials, and assignments through March 13th (inclusive).

Final Exam: The final exam will cover material in the assigned readings, posted online materials, and assignments for the entire course but emphasize the topics following the midterm exam. The exam will be online **May 1st** at the regular class time. In the event that you have circumstances that make it difficult to take the exam at this time, please notify the instructor of this issue at least 2 weeks prior to the exam so that other arrangements can be made.

Problem Sets: The problem sets are to be submitted (in a typed format) to the appropriate Dropbox in Folio prior to the due dates indicated in the syllabus. The assignments involve applied computation relevant to epidemiologic analysis. The assignments must be a student's own work (i.e., each student must turn in a completed assignment), but students are encouraged and allowed to work together in solving the problems and assisting each other with the exercises. Selected portions of the problem sets may be discussed in the class.

Problem Set Number	Topic	Due Date
1	Measures of frequency and association	February 9
2	Case control studies, confounding, and other biases	March 2
3	Interaction assessment	March 30
4	Multiple logistic regression	April 20

Applied Data Project: The analysis project for the course requires that you apply some of the analytic techniques that we will be discussing to the analysis of a real dataset. The due date of the applied data project is **April 27th**. The primary objective of this assignment is to provide you with further experience in the interpretation and presentation of epidemiologic data. Your course instructor will be selecting one or two datasets that will be used for this project. The datasets will be accessible via Folio as either SPSS, SAS or Stata files. The files can be converted into formats of other statistical packages if needed. Documentation of the variables in the dataset and guidance regarding the data collection procedures to generate the dataset will be given. In addition, some general research questions will be provided and perhaps a brief sketch of an analysis plan. However, the operational decisions regarding how to analyze the data will be made by you. Additional information on this project will be distributed in class.

This course and the project are premised on the conviction that the best way to learn about epidemiologic methods is to PRACTICE them – not just read about them.

Class Participation: Students enrolled in the class are expected to have read the assigned readings prior to the class. The instructor may designate certain students to be responsible for leading the discussion of an assigned reading as part of the class participation grades. Students will be advised in advance about which readings they are responsible for in leading the discussion. However, it is expected that all students will read the material and be prepared to address questions on the readings for each weekly session. Students are also expected to actively participate in the weekly online sessions offered by the Teaching Assistant, Adam Middleton. These sessions are being offered to help you with the problem sets and to review and get clarification on any course material. The online sessions DO count toward your participation grade for this course.

Late Submissions

Late assignments are penalized at 15 points (out of total number of points for the assignment) for each calendar day late. The maximum penalty is 3 calendar days late; after that, your assignment will not be graded and counted as “0” points.

Instructor Expectations

1. I expect you to attend every one of the four class sessions. The components are highly interrelated; missing a class will detract from the learning potential of subsequent sessions, as well as your evaluation of in-class discussion.
2. I expect you to be in the classroom and prepared to begin work at the scheduled starting time for each session.
3. I expect you to actively participate in the discussions. This is not the type of class where you can “sit back and listen.”
4. I expect you to submit written assignments using proper English grammar, syntax, and spelling. You are encouraged to use spell check and grammar check prior to submitting your written work. The University Writing Center is available to anyone who may need assistance (<http://class.georgiasouthern.edu/writingc/>). Grammar, syntax, and spelling will account for 10% of the grade for each assignment.
5. I expect (and encourage) you to provide honest and timely feedback regarding the content and process of this course throughout the semester.
6. I expect (and encourage) you to share the responsibility for making this course an enjoyable and beneficial learning experience.
7. Wikipedia *cannot* be used as a cited reference as noted by a co-founder of Wikipedia! You may use Wikipedia to identify appropriate source material. Remember Wikipedia is *not* peer reviewed!
8. I require that each learner will utilize the *APA Publication Manual* as a guide for writing papers for this course and the grading rubric will be based on its precepts.

Academic Misconduct:

As a student registered at this University, it is expected that you will adhere to only the strictest standards of conduct. It is recommended that you review the latest edition of the *Student Conduct Code* book, as well as the latest *Undergraduate & Graduate Catalog* to familiarize yourself with the University's policies in this regard. Your continued enrollment in this course is an implied contract between you and the instructor on this issue; from this point forward, it is assumed that you will conduct yourself appropriately.

Academic integrity relates to the appropriate use of intellectual property. The syllabus, lecture notes, and all materials presented and/or distributed during this course are protected by copyright law. Students are authorized to take notes in class, but that authorization extends only to making one set of notes for personal (and no other) use. As such, students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without the express written permission of the instructor.

The Fine Print:

"According to the Academic Dishonesty Policy of GSU, Plagiarism includes (but is not limited to):

- A. Directly quoting the words of others without using quotation marks or indented format to identify them.
- B. Using published or unpublished sources of information without identifying them.
- C. Paraphrasing material or ideas without identifying the source.
- D. Unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic material.

If you are accused of plagiarism by a JPHCOPH, the following policy, as per the Judicial Affairs website (<http://students.georgiasouthern.edu/judicial/faculty.htm>) will be enforced:

PROCEDURES FOR ADJUDICATING ACADEMIC DISHONESTY CASES

First Offense - In Violation Plea

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is a first violation of academic dishonesty. The incident will be reported via the following website:
<http://students.georgiasouthern.edu/judicial/faculty.htm>
2. If it is a first violation, the professor should talk with the student about the violation. If the student accepts responsibility in writing and the professor decides to adjudicate the case, the following procedures will be followed:
 - a. The student will be placed on disciplinary probation for a minimum of one semester by the Office of Judicial Affairs.
 - b. The student will be subject to any academic sanctions imposed by the professor (from receiving a 0 on the assignment to receiving a failing grade in the class).
 - c. A copy of all the material involved in the case (Academic Dishonesty Report Form and the Request For Instructor to Adjudicate Form) and a brief statement from the professor concerning the facts of the case and the course syllabus should be mailed to the Office of Judicial Affairs for inclusion in the student's discipline record.

First Offense - Not In Violation Plea (student does not admit the violation)

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is the first or second violation of academic dishonesty. The student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case. If the student is found responsible, the following penalty will normally be imposed:

- a. The student will be placed on Disciplinary Probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor.

Second Violation of Academic Dishonesty

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, and if it is determined this is the second violation, the student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case.

If the student is found responsible, the following penalty will normally be imposed:

- a. Suspension for a minimum of one semester or expulsion.
- b. The student will be subject to any academic sanctions imposed by the professor.

NOT RESPONSIBLE FINDING

When a student is found not responsible of academic dishonesty, the work in question (assignment, paper, test, etc.) would be forwarded to the Department Chair. It is the responsibility of the Department Chair to ensure that the work is evaluated by a faculty member other than the individual who brought the charge and, if necessary, submit a final grade to the Registrar. For the protection of the faculty member and the student, the work in question should not be referred back to the faculty member who charged the student with academic dishonesty.

In the case of a Department Chair bringing charges against a student, an administrator at the Dean's level will ensure that the student's work is evaluated in an appropriate manner.

CONFIDENTIALITY

In accordance with provisions of the Family Educational Rights and Privacy Act of 1974 and the Georgia Open Records Act, any information related to a violation of academic dishonesty or the outcome of a judicial hearing regarding academic dishonesty, is prohibited and must be treated as confidential by members of the faculty."

Academic Handbook:

Students are expected to abide by the Academic Handbook, located at <http://students.georgiasouthern.edu/sta/guide/>. Your failure to comply with any part of this Handbook may be a violation and thus, you may receive an F in the course and/or be referred for disciplinary action.

University Calendar for the Semester:

The University Calendar is located with the semester schedule, and can be found at: <http://calendar.georgiasouthern.edu/>

Attendance Policy:

Federal regulations require attendance be verified prior to distribution of financial aid allotments. Attendance will not be recorded after this initial period.

Accommodations

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, submit to me a Letter of Accommodation from the Student Disability Resource Center (<http://students.georgiasouthern.edu/disability/>). If you have not already done so, please register with the Student Disability Resource Center for coordination of campus disability services available to students with disabilities.

One Final Note:

The contents of this syllabus are as complete and accurate as possible. The instructor reserves the right to make any changes necessary to the syllabus and course material. The instructor will make every effort to inform students of changes as they occur. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course.