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Fall 2017

### EPID 7134 – Epidemiologic Methods II

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**Georgia Southern University**  
**Jiann-Ping Hsu College of Public Health**

EPID 7134 – Epidemiologic Methods II  
Fall 2017

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<b><u>Office Hours:</u></b>	Monday and Wednesday 11:30AM – 2:00PM and by appointment

Course Catalog available at: <a href="http://students.georgiasouthern.edu/registrar/pdf/catalogs/GraduateCatalog/index.htm">http://students.georgiasouthern.edu/registrar/pdf/catalogs/GraduateCatalog/index.htm</a> under Jiann-Ping Hsu College of Public Health Programs
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**Prerequisites:** EPID 7133 or equivalent or permission of instructor.

**FOLIO address:** <http://my.georgiasouthern.edu>

**Catalog Description**

This course provides instruction and hands-on experience in the analysis and interpretation of data from epidemiologic studies. Topics to be covered include epidemiology research questions that can be addressed by cross-sectional, case-control and cohort studies; the rationale underlying the major techniques used to analyze data from these studies; the conditions under which these methods are appropriate and their relative advantages and disadvantages. Attention will be given to how interactions, confounders and nonlinear relationships among variables can be addressed along with interpretation of statistical software output from epidemiologic studies employing these designs and analytical methods.

**Required Textbooks:**

1. Introduction to Health Research Methods, Second Edition  
Author(s): Kathryn H. Jacobsen, MPH, PhD  
ISBN-13: 9781284094381
2. Statistical Methods in Epidemiologic Research  
Author(s): Ray M. Merrill, PhD, MPH  
ISBN-13: 9781284050202

### **Recommended Software:**

SAS 9.4 – available for purchase at discounted price from GSU. This is optional as students can choose to complete assignments on classroom computers, on campus computers equipped with SAS, or via vLab.

### **Response times:**

During a normal work week (i.e., Monday 9:00 AM through Friday 5:00 PM) students can expect responses as follows:

- Email: within 48 hours
- Discussion posts: within 72 hours
- Assignment grades: within 72 hours of submission date.

Exceptions: I do not check FOLIO or GSU email over the weekends. If you send me an email after 5:00 PM on Friday, please do not expect a response until the following Monday.

### **MPH Epidemiology Student Learning Outcomes**

1. Demonstrate proficiency and effectiveness in the communication of core public health principles and practices, both oral and written.
2. Demonstrate proficiency in the integration of the core public health disciplines (Biostatistics, Epidemiology, Environmental Health, Health Policy/Management, and Social/Behavioral Science) in practice and research.
3. Demonstrate proficiency in problem solving, critical thinking, and public health leadership.
4. Formulate population-based hypotheses and develop appropriate research designs to test these hypotheses.
5. Collect, analyze, and interpret data derived from population-based research.
6. Create and implement public health surveillance systems for population-based studies.
7. Recommend evidence-based interventions and control measures in response to epidemiologic findings.
8. Communicate epidemiologic principles and concepts to lay and professional audiences through both oral and written communication.

### **MPH Core Competencies in Epidemiology**

Upon graduation, a student with an MPH degree should be able to:

1. Describe a public health problem in terms of magnitude, person, and time in rural and urban settings.
2. Analyze data from epidemiologic investigations, studies, and surveillance, with special emphasis on the identification of health disparities and promotion of health equity.
3. Apply principles of causation to make judgments about causal inference from epidemiologic data.
4. Apply the principles and limitations of public health screening programs.
5. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.
6. Apply basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data.
7. Explain the basic terminology and definitions of epidemiology.

8. Identify the role of laboratory resources in epidemiologic activities.
9. Explain how determinants of health affect public health practice.
10. Communicate epidemiologic information to lay and professional audiences.
11. Identify the strengths and limitations of epidemiologic research findings.
12. Explain the different uses of basic study designs and selection of variables used in public health.

### **Performance-Based Objectives Linked to Course Activities**

1. Demonstrate critical thinking skills to determine whether a public health problem exists. (Competency 1, 3)
2. Quantify population-based health risk. (Competency 1, 3, 2, 7)
3. Conduct thorough search of the scientific literature and public health databases using search engines and methods relevant to a public health problem. (Competency 1, 3, 7, 11)
4. Explain the need for further investigation or other public health action on the basis of results of literature review and assessment of current data. (Competency 1, 11)
5. Describe the major epidemiologic study designs, including the strengths and weaknesses of each. (Competency 7, 11, 12)
6. Construct a hypothesis for the epidemiologic study of a public health problem. (Competency 1, 3, 7, 9, 12)
7. Select appropriate study design within existing constraints. (Competency 6, 7, 12)
8. Identify target population for investigation. (Competency 2, 7, 12)
9. Create a case definition. (Competency 3, 6, 7, 8, 12)
10. Establish inclusion and exclusion criteria (Competency 3, 6, 7, 8, 12)
11. Identify possible sources of bias (Competency 3, 6, 7, 8, 12)
12. Identify cultural factors that may influence the outcome of an epidemiologic study (Competency 9, 11)
13. Identify methods to minimize potential sources of bias (Competency 3, 6, 7, 8, 12)
14. Identify potential confounders (Competency 3, 6, 7, 8, 12)
15. Design strategies to minimize or eliminate potential confounding. (Competency 3, 6, 7, 8, 12)
16. Identify sampling methods given the context of the public health problem. (Competency 1, 2, 4, 7, 12)
17. Adhere to national standards of coding and variables to ensure accuracy and ease of analysis. (Competency 2, 12)
18. Write and run SAS survey procedures for sample survey data and interpret output. (Competency 1, 2, 12).
19. Perform data cleaning and error correction. (Competency 2)
20. Understand and implement the steps in analyzing data from an epidemiological case-control study or cohort study. (Competency 1, 11, 12)
21. Present results of analyses using advanced regression models to professional and lay audiences. (Competency 9, 10, 11)
22. Demonstrate writing skills to effectively maximize the readership and impact of your research. (Competency 1, 9, 10, 11)

## Course Structure

This course is offered in a traditional fashion of face-to-face lecture. There will be numerous times that the lectures are simply trying to address the major and common issues you or your team encounter with your project. The major and common issues would be picked-up from students' comments made in discussion activities of each learning module, and other communications between the instructor and students. All individual-specific issues (i.e. one or two out of the group are struggling with) will be discussed between the students who have these problems and the instructor. Since this course is designed for you to get the hands-on experience by conducting a real individualized research, it would be not surprising that we, as a group, will have more individual-specific issues than common issues. One-on-one meeting will be arranged as the course progresses.

This course is structured as 3 units.

- Unit 1 will address analysis of primary data including bivariate associations and assessment of confounding and effect modification. A final manuscript will be written based on this work.
- Unit 2 will provide experience analyzing existing data incorporating sampling weights. SAS skills required to work with large data sets will be introduced and used to conduct an analysis.
- Unit 3 will require students to apply the methods they have learned to develop and propose a new study. This proposal will address basic aspects including the study participants, assessments, ethics and analytic considerations.

**Lecture format:** For the programming learning modules (basic SAS programming language), a typical class would be started by instructor's brief presentation on the basic concept and illustrative examples pertain to the concept (30-45 min), this would be followed by a lab session, in which students do the in-class exercises provided by the instructor. On-site assistance will be provided on individuals-bases during this lab time. The lectures of other learning modules will be processed in a traditional way, i.e. instructor's lecture followed by in-class discussion.

## Netiquette

Because online communication generally lacks visual cues common to face-to-face interactions, you are expected to follow these standards. Netiquette is a combination of Network Etiquette. Please abide by the following netiquette rules when communicating with your instructor and peers in this class.

- Be sensitive and reflective to what others are saying.
- Don't use all caps. It is the equivalent of screaming.
- Don't flame - These are outbursts of extreme emotion or opinion.
- Think before you hit the post (enter/reply) button. You can't take it back!
- Don't use offensive language.
- Use clear subject lines.
- Don't use abbreviations or acronyms unless the entire class knows them.
- Be forgiving. Anyone can make a mistake.
- Keep the dialog collegial and professional.

## Assignments/Evaluations

Active engagement with the materials, peers, and the instructor is required to successfully complete this course. Points for each assignment are provided in the course schedule sheet. Late work will receive zero credit. We will emphasize the quality of written assignments in evaluations, but each research-related assignment will also be given to corresponding points to reflect that you are making progress as planned.

See Course Outline for specific topics and dates.

Course evaluations will include:

- quizzes (Note: Most quizzes are due BEFORE class each week);
- manuscript based on original research;
- research project involving secondary data;
- development of a research proposal.

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Steps	Recommended number of pages *	Feature or Contents
<b>Manuscript</b>		
Method section	4 pages	Definition of study population, exclusion (inclusion) criteria, variable definitions and statistical approaches
Result section	2 pages	Description of your findings, you are encouraged to include charts, figures in addition to tables
Abstract	1 page	Objective, method, results, conclusion,
Introduction	2 pages	Short revision of your research proposal without method section
Discussion	5 pages	Summary of your findings, why differ or consistent with others, unique contribution your study is making to knowledge, strengths and limitation of your research and policy/science implications
Completed manuscript	< 20 pages	Put all parts together, title page, abstract, running title, key words, introduction, method, results, discussion, acknowledge, reference, tables, figure (if applicable)  The submission should be the version with approval of the entire team, and the team receives one grade. However, each member of the team may receive different points depending on the contribution you make your team project.

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\* double space



**GRADING:**

<b>Component</b>	<b>Points</b>
Quizzes – 5 to 15 points each	120
Unit 1 assignments:	
Analytic plan	20
Results table	50
Final manuscript	100
Unit 2 assignments:	
Topic, variables, rationale	20
Table templates	20
Final variables	20
Final write-up	50
Unit 3 assignments:	
Topic, rationale, objectives	20
Sampling plan	20
Assessment plan	20
Confounding/EM plan	20
IRB	20
Final proposal	50
Exam 1	100
Final Exam	100
Total possible points	750

90+% =A,  
80-89%=B,  
70-79%=C,  
60-69%=D,  
Below 60%=F

All assignments will be graded promptly so that students may accurately calculate their grades at any point in time during the semester. There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such circumstances, and/or if you need additional time to satisfactorily complete any course requirement, please consult with the instructor within a reasonable amount of time.

Electronic submission of assignments via Folio Dropbox is required. For any assignments with SAS required, please submit your code, log and results/output. You are responsible for these submissions and if the files are not received in a readable format, hard-copies are due at the same time in my mailbox.



### *Tips for successful completion of this course*

Never be hastate to ask your instructor for help

- (1) A missing “;” in SAS program might take you a week to figure out.
- (2) A wrong direction of your project might end with a meaningless conclusion.

Never be hastate to ask your teammates for help

- (3) It might take an experienced full-time researcher 3+ months to finish a project.
- (4) A completed epidemiological picture is a product of multiple perspectives.

There are times when extraordinary circumstances occur (e.g., serious illness, death in the family, etc.). In such circumstances, please consult with the instructor within a reasonable amount of time. Extensions are not guaranteed and will be granted solely at the discretion of the instructor.

**NO EXTRA CREDIT PROJECTS WILL BE ASSIGNED!**

### **Expectations**

This course will involve a considerable amount of calculations and programming, Epidemiology is not just numbers. Understanding what the numbers you calculate *mean* and how they are interpreted is ***critical*** to your success in this course and as a public health professional. How I present numbers with labels and interpretation in the lectures is how I expect for you to do the same in your assignments. Your answer should have meaning when separated from the work leading up to the final answer. Similarly, on assignments and in your manuscript, when I ask for an interpretation I expect that you will provide an interpretation that is relevant to the problem you are working on. It is not enough to say that “people with the exposure were 2.5 times more likely to have disease.” Your interpretation should be stated as (e.g., in a smoking and lung cancer question) “People who smoked were 2.5 times more likely to develop lung cancer than people who never smoked,” for example.

If you have ANY questions about how to report your results, write out your answers, carry decimal places, round off answers, select a constant, or anything else relevant to turning in assignments or writing exams, ask me ***before*** turning in the assignment to avoid losing points.

### **Class Attendance and Participation Policy**

Federal regulations require attendance be verified prior to distribution of financial aid allotments. Regular attendance is expected. Your attendance will be verified at the first regular class session.

For in-person class meeting, please come to class on time and be prepared to stay until the end of class. Cell phones should not be used in class. Please set them to “vibrate” in case of emergency or if you have an urgent personal or professional reason for expecting a call. “Side” conversations among students are not acceptable unless your conversation is a course-related one.

## **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.

## **Plagiarism**

"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 Discipline Coordinator. It is the responsibility of the Discipline Coordinator 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 Discipline Coordinator 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://admissions.georgiasouthern.edu/pdf/orientation/documents/Eagle%20Eye/EagleEye.pdf>. 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://students.georgiasouthern.edu/registrar/resources/calendars>

### Portfolio Inclusion

Samples of your work may be reproduced for search purposes and/or inclusion in the professor's teaching portfolio. You have the right to review anything selected for use, and subsequently ask for its removal.

**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 announce any such changes in class. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course.